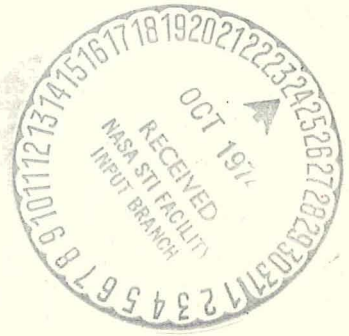
GP-592
REVISION 32
OCTOBER 4 1974

JOHN F. KENNEDY
SPACE CENTER

Is the earlier version in? If not, then get DRA

LAUNCH VEHICLE
CATALOG OF TESTS AND OPERATIONS



Prepared For
LAUNCH VEHICLE OPERATIONS

Prepared By
THE BOEING COMPANY
ATLANTIC TEST CENTER
SATURN – LAUNCH OPERATIONS

KSC FORM 16-12 (4/66)

NASA-PAFB JAN

CHANGE LOG

CHANGES TO THE ORIGINAL DOCUMENT ARE LISTED BELOW:

REVISION		ISSUE DATE
19	COMPLETE REVISION	01/05/72
20	PARTIAL REVISION	03/02/72
21	" "	05/23/72
22	" "	07/24/72
23	" "	10/16/72
24	" "	01/01/73
25	" "	02/09/73
26	" "	03/16/73
27	" "	06/01/73
28	" "	08/03/73
29	" "	09/06/73
30	" "	12/10/73
31	" "	06/03/74
32	" "	10/04/74

CATALOG OF TESTS AND OPERATIONS
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CHANGE SUMMARY — REV 32

TEST CATALOG SHEET	CONTRACTOR	CHANGE				NOTES
		NEW	REVISED	CANCELLED	DELETED	
V-20083	TBC	X				
V-20084			X			
V-20085		X				
V-20086		X				
V-20100			X			
V-20101			X			
V-20102			X			
V-20103			X			
V-20104			X			
V-20105			X			
V-20106			X			
V-20107			X			
V-20108			X			
V-20109			X			
V-20110			X			
V-20111			X			
V-20112			X			
V-20113		X				
V-20114			X			
V-20115			X			
V-20116			X			
V-20117			X			
V-20118	TBC		X			

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CHANGE SUMMARY – REV 32

TEST CATALOG SHEET	CONTRACTOR	CHANGE				NOTES
		NEW	REVISED	CANCELLED	DELETED	
V-20119	TBC		X			
V-20120	"		X			
V-20126	"		X			
V-20127	"		X			
V-20128	"		X			
V-20129	"		X			
V-20130	"		X			
V-20131	"		X			
V-20132	"		X			
V-20133	TBC		X			
V-21223	IBM		X			
V-21255	"		X			
V-21478	"		X			
V-21479	"		X			
V-21497	IBM		X			
V-21536	MDC		X			
V-21537	MDC		X			
V-21564	IBM		X			
V-21574	IBM		X			
V-21583	CCSD	X				
V-21584	CCSD	X				
V-23030	IBM		X			
V-23155	IBM		X			

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CHANGE SUMMARY – REV 32

TEST CATALOG SHEET	CONTRACTOR	CHANGE				NOTES
		NEW	REVISED	CANCELLED	DELETED	
V-23198	IBM		X			
V-23221			X			
V-23222			X			
V-23223			X			
V-23225			X			
V-23226	IBM		X			
V-23260	CCSD		X			
V-23261			X			
V-23262			X			
V-23263			X			
V-23264			X			
V-23266			X			
V-23267			X			
V-23268			X			
V-23269			X			
V-23275			X			
V-23276	CCSD		X			
V-23279	IBM		X			
V-23280			X			
V-23281			X			
V-23282			X			
V-24223			X			
V-24228	IBM		X			

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CHANGE SUMMARY – REV 32

TEST CATALOG SHEET	CONTRACTOR	CHANGE				NOTES
		NEW	REVISED	CANCELLED	DELETED	
	IBM					
V-24298			X			
V-24299			X			
V-24391			X			
V-24407			X			
V-24408			X			
V-24422			X			
V-24435			X			
V-24437			X			
V-24443			X			
V-24445	IBM		X			
V-24497	CCSD		X			
V-24499	CCSD		X			
V-24522	CCSD		X			
V-24527	CCSD		X			
V-24537	MDC		X			
V-24561	IBM	X				
V-24579	CCSD	X				
V-26491	IBM		X			
V-26492	IBM		X			
V-26497	IBM		X			
V-26533	CCSD			X		
V-26547	IBM		X			

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CHANGE SUMMARY – REV 32

TEST CATALOG SHEET	CONTRACTOR	CHANGE				NOTES
		NEW	REVISED	CANCELLED	DELETED	
V-26548	IBM		X			
V-26549	IBM		X			
V-26683	IBM		X			
V-27250	MDC		X			
V-28003	NASA			X		
V-28004				X		
V-28005			X			
V-28008				X		
V-28009	NASA			X		
V-28054	IBM		X			
V-28055	IBM		X			
V-28056	IBM		X			
V-28070	NASA		X			
V-28150	NASA			X		
V-28184	NASA			X		
V-28203	CCSD		X			
V-28205	CCSD		X			
V-28218	CCSD		X			
V-28223	CCSD		X			
V-28232	IBM		X			
V-28233	IBM		X			
V-30050	TBC			X		
V-30053	TBC				X	CANCELLED IN REV 31

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CHANGE SUMMARY – REV 32

TEST CATALOG SHEET	CONTRACTOR	CHANGE				NOTES
		NEW	REVISED	CANCELLED	DELETED	
V-30054	TBC				X	CANCELLED IN REV 31
V-30056					X	
V-30068					X	
V-30080					X	
V-30086					X	
V-30089					X	
V-30099					X	
V-30104					X	
V-30113					X	CANCELLED IN REV 31
V-30115				X		
V-30116					X	CANCELLED IN REV 31
V-30125					X	CANCELLED IN REV 31
V-30128					X	CANCELLED IN REV 31
V-30148				X		
V-30149				X		
V-30166				X		
V-30169					X	CANCELLED IN REV 31
V-30187					X	
V-30199					X	
V-30204					X	
V-30222					X	
V-30226					X	
V-30260	TBC				X	CANCELLED IN REV 31

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CHANGE SUMMARY – REV 32

TEST CATALOG SHEET	CONTRACTOR	CHANGE				NOTES
		NEW	REVISED	CANCELLED	DELETED	
V-30274	TBC			X		
V-30313					X	CANCELLED IN REV 31
V-30337					X	CANCELLED IN REV 31
V-30340					X	CANCELLED IN REV 31
V-30361				X		
V-30366					X	CANCELLED IN REV 31
V-30376					X	
V-30384					X	
V-30389					X	
V-30391					X	
V-30405					X	
V-30413					X	CANCELLED IN REV 31
V-30419				X		
V-30437					X	CANCELLED IN REV 31
V-30445					X	CANCELLED IN REV 31
V-30452				X		
V-30456					X	CANCELLED IN REV 31
V-30465					X	
V-30488					X	
V-30500					X	
V-30511					X	
V-30523					X	
V-30537	TBC				X	CANCELLED IN REV 31

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CHANGE SUMMARY – REV 32

TEST CATALOG SHEET	CONTRACTOR	CHANGE				NOTES
		NEW	REVISED	CANCELLED	DELETED	
V-30538	TBC				X	CANCELLED IN REV 31
V-31011	IBM		X			
V-31108	IBM		X			
V-31133	CCSD		X			
V-33038	CCSD		X			
V-33039	CCSD		X			
V-34017	IBM		X			
V-34046	IBM		X			
V-34047	IBM		X			
V-34053	CCSD		X			
V-36038	IBM		X			
V-36046	IBM		X			
V-36112	TBC				X	CANCELLED IN REV 27
V-38010	CCSD		X			

LIST OF DELETED PAGES	DATE 10/4/74		DOCUMENT GP-592	REVISION 32	PAGE A

TEST NO.	REV.	TEST NO.	REV.	TEST NO.	REV.	TEST NO.	REV.	TEST NO.	REV.
V-20084	-	V-24498	A	V-30383	A				
V-20100	A	V-24522	E	V-30387	-				
V-20101	C	V-24526	-	V-30391	A				
V-20102	A	V-24536	D	V-30404	A				
V-20103	G	V-24561	A	V-30412	-				
V-20105	A			V-30416	-				
V-20106	E	V-26491	C	V-30437	A				
V-20108	C	V-26497	D	V-30445	A				
V-20109	A	V-26532	C	V-30452	A				
V-20111	B	V-26546	-	V-30455	-				
V-20114	A	V-26548	B	V-30465	A				
V-20117	G	V-26682	A	V-30488	A				
V-20119	B	V-27250	A	V-30500	A				
V-20126	A	V-28003	B	V-30510	-				
V-20127	C	V-28005	B	V-30523	A				
V-20129	A	V-28009	A	V-30537	A				
V-20130	G	V-28054	C	V-31011	D				
V-20131	-	V-28056	F	V-31108	C				
V-20132	D	V-28069	B	V-33037	A				
V-21223	H	V-28150	B	V-33039	-				
V-21255	E	V-28182	-	V-34017	D				
V-21478	C	V-28202	A	V-34045	C				
V-21496	-	V-28204	A	V-34047	H				
V-21535	-	V-28217	-	V-34052	B				
V-21537	-	V-28223	A	V-36038	F				
V-21564	A	V-28231	-	V-36046	B				
V-21572	-	V-28233	-	V-36111	-				
V-21582	-	V-30049	-	V-38010	-				
V-23029	K	V-30053	A						
V-23155	E	V-30055	-						
V-23197	A	V-30066	-						
V-23220	A	V-30079	A						
V-23222	-	V-30086	A						
V-23224	-	V-30089	A						
V-23226	-	V-30098	-						
V-23259	B	V-30103	-						
V-23261	A	V-30112	-						
V-23263	-	V-30115	-						
V-23265	A	V-30124	A						
V-23267	-	V-30128	A						
V-23269	-	V-30147	-						
V-23275	-	V-30149	-						
V-23279	A	V-30166	A						
V-23281	A	V-30187	A						
V-23282	B	V-30199	A						
V-24223	E	V-30201	A						
V-24228	J	V-30220	-						
V-24298	E	V-30225	-						
V-24391	D	V-30258	A						
V-24407	D	V-30270	A						
V-24422	A	V-30313	A						
V-24434	-	V-30337	A						
V-24436	A	V-30340	A						
V-24442	A	V-30361	A						
V-24444	A	V-30366	A						
V-24497	B	V-30375	A						

NOTE: REVISION INSTRUCTIONS APPEARING ON PAGE 111 OF THIS DOCUMENT SHOULD BE CLEARLY FOLLOWED.

LIST OF ADDED PAGES	DATE 10/4/74		DOCUMENT GP-592	REVISION 32	PAGE B

TEST NO.	REV.	TEST NO.	REV.	TEST NO.	REV.	TEST NO.	REV.	TEST NO.	REV.
V-20083	A	V-24434	-	V-30375	A				
V-20085	A	V-24436	A	V-30383	A				
V-20100	B	V-24442	A	V-30387	-				
V-20101	D	V-24444	A	V-30393	A				
V-20102	B	V-24497	D	V-30404	A				
V-20103	H	V-24498	A	V-30412	-				
V-20105	C	V-24522	F	V-30416	-				
V-20106	F	V-24526	-	V-30438	A				
V-20108	E	V-24536	D	V-30446	-				
V-20109	B	V-24561	B	V-30452	B				
V-20111	C	V-24579	-	V-30455	-				
V-20113	-	V-26491	D	V-30490	-				
V-20114	C	V-26497	E	V-30510	-				
V-20116	E	V-26532	C	V-31011	E				
V-20117	H	V-26546	-	V-31108	D				
V-20119	C	V-26548	C	V-31133	A				
V-20126	B	V-26682	A	V-33037	A				
V-20127	D	V-27250	B	V-33039	A				
V-20129	B	V-28003	C	V-34017	E				
V-20130	H	V-28005	C	V-34045	C				
V-20131	C	V-28009	B	V-34047	I				
V-20132	E	V-28054	D	V-34052	B				
V-21223	I	V-28056	G	V-36038	G				
V-21255	F	V-28069	C	V-36046	C				
V-21478	D	V-28150	C	V-36111	-				
V-21496	-	V-28182	-	V-38010	A				
V-21535	-	V-28202	A						
V-21537	A	V-28204	A						
V-21564	B	V-28217	-						
V-21572	-	V-28223	B						
V-21582	-	V-28231	-						
V-21584	-	V-28233	A						
V-23029	K	V-30049	-						
V-23155	F	V-30055	-						
V-23197	A	V-30066	-						
V-23220	A	V-30079	-						
V-23222	A	V-30088	A						
V-23224	-	V-30090	B						
V-23226	A	V-30098	-						
V-23259	B	V-30103	-						
V-23261	B	V-30112	-						
V-23263	A	V-30115	A						
V-23265	A	V-30124	A						
V-23267	A	V-30129	-						
V-23269	A	V-30147	-						
V-23275	A	V-30149	A						
V-23279	B	V-30166	B						
V-23281	B	V-30201	A						
V-23282	C	V-30220	-						
V-24223	I	V-30225	-						
V-24228	K	V-30258	A						
V-24298	F	V-30270	A						
V-24391	E	V-30314	A						
V-24407	E	V-30361	B						
V-24422	B	V-30369	-						

NOTE: REVISION INSTRUCTIONS APPEARING ON PAGE iii OF THIS DOCUMENT SHOULD BE CLEARLY FOLLOWED.

APOLLO/SATURN V INDEX OF LAUNCH VEHICLE TEST AND OPERATIONS CATALOG SHEETS

TEST NUMBER	REVISION LEVEL	INDEX CHANGE EFFECTIVE	
V-20004	E	8/9/71	H
V-20010	J	8/3/73	H
V-20017	P	8/3/73	H
V-20022	M	8/3/73	H
V-20025	D	7/24/72	-
V-20026	I	7/24/72	-
V-20032	G	8/3/73	H
V-20037	H	8/3/73	H
V-20038	C	8/3/73	H
V-20048	N	8/3/73	-
V-20049	J	8/3/73	H
V-20052	A	4/15/69	-
V-20056	B	3/25/71	H
V-20060	X	8/3/73	H
V-20062	C	1/1/73	-
V-20064	C	2/9/73	H
V-20066	F	5/23/72	-
V-20067	G	1/1/73	H
V-20070	H	8/3/73	-
V-20072		7/21/69	-
V-20074		8/12/69	H
V-20076	B	3/2/72	-
V-20077		9/17/70	H
V-20078	-	8/3/73	H
V-20079	A	8/3/73	H
V-20080	B	1/5/72	H
V-20081	B	8/3/73	H
V-20083	A	10/4/74	H
V-20084	A	10/4/74	-
V-20085	A	10/4/74	H
V-20086	A	10/4/74	H
V-20100	B	10/4/74	-
V-20101	D	10/4/74	-
V-20102	B	10/4/74	H
V-20103	H	10/4/74	H
V-20104	C	10/4/74	-
V-20105	C	10/4/74	-
V-20106	F	10/4/74	H
V-20107	E	10/4/74	H
V-20108	E	10/4/74	H
V-20109	B	10/4/74	H
V-20110	B	10/4/74	H
V-20111	C	10/4/74	H
V-20112	E	10/4/74	H
V-20113	A	10/4/74	H
V-20114	C	10/4/74	-

V-20115	C	10/4/74	H
V-20116	E	10/4/74	H
V-20117	H	10/4/74	H
V-20118	A	10/4/74	-
V-20119	C	10/4/74	H
V-20120	E	10/4/74	H
V-20121	B	6/1/73	H
V-20122	B	8/3/73	H
V-20126	B	10/4/74	-
V-20127	D	10/4/74	H
V-20128	D	10/4/74	H
V-20129	B	10/4/74	H
V-20130	H	10/4/74	H
V-20131	C	10/4/74	H
V-20132	E	10/4/74	H
V-20133	A	10/4/74	H
V-20141		5/23/72	-
V-20142		5/23/72	H
V-20143		5/23/72	-
V-20144	A	7/24/72	H
V-20145		5/23/72	-
V-20146	A	10/5/72	-
V-20147		5/23/72	H
V-20148		5/23/72	-
V-20149	A	10/5/72	H
V-20150		5/23/72	-
V-20151	B	10/5/72	H
V-20152	A	6/1/73	-
V-20153	B	10/5/72	-
V-20154		5/23/72	H
V-20155		5/23/72	-
V-20156		5/23/72	-
V-20157		5/23/72	-
V-20158		5/23/72	H
V-21002	C	2/9/70	-
V-21005	H	1/5/72	-
V-21006	F	9/17/70	-
V-21007	G	7/24/72	-
V-21008	A		H
V-21009	B		H
V-21010	D	1/5/72	H
V-21012	B		H
V-21013	C	9/17/70	H
V-21014	A	1/5/72	H
V-21015	D	1/5/72	H
V-21018	D	4/10/70	H
V-21019	A	8/9/71	H
V-21020			-
V-21022	F	1/1/73	H
V-21023	C	11/5/70	-
V-21028	C	6/17/70	-
V-21032	A		-
V-21034	C	8/9/71	-

V-21035	B	11/5/70	-
V-21036	A	5/27/69	-
V-21037	A		-
V-21038	C	2/9/70	-
V-21065	F	6/17/70	-
V-21067	B	5/23/72	-
V-21072	E	8/9/71	-
V-21075	E	6/1/73	-
V-21083	A	8/12/69	-
V-21084	J	3/2/72	-
V-21096	G	2/9/73	-
V-21097	C	4/10/70	-
V-21100	D	5/23/72	-
V-21101	H	1/1/73	H
V-21103	E	11/5/70	-
V-21105	B	3/2/72	-
V-21107	C	7/24/72	-
V-21109	C	2/9/70	-
V-21110	C	1/30/69	-
V-21111	D	1/1/73	-
V-21124	A	1/8/72	-
V-21152	D	1/5/72	-
V-21153	A	1/5/72	-
V-21158	C	1/5/72	-
V-21159	C	1/5/72	-
V-21161	C	3/25/71	-
V-21162	C	1/5/72	-
V-21163	C	1/5/72	-
V-21164	C	1/5/72	-
V-21165	C	1/5/72	-
V-21166	C	1/5/72	-
V-21174			-
V-21176	C	1/5/72	-
V-21191	C	6/17/70	-
V-21194	B	6/20/69	-
V-21196			-
V-21203	B	2/9/70	-
V-21204	L	8/9/71	H
V-21205	B	2/9/70	-
V-21210			-
V-21214	H	5/23/72	-
V-21222	D	5/23/72	-
V-21223	I	10/4/74	-
V-21225	A	3/25/71	-
V-21227	C	5/23/72	-
V-21230	A		-
V-21241	B	8/9/71	-
V-21243	E	3/2/72	-
V-21245	B	2/9/73	-
V-21247			-
V-21249	C	2/9/70	-
V-21255	F	10/4/74	-
V-21259	E	1/5/72	-

V-21260	F	6/1/73	-
V-21261	E	7/24/72	-
V-21262	E	5/23/72	-
V-21263	E	5/23/72	-
V-21264	F	8/9/71	-
V-21266	B	5/23/72	-
V-21267	C	12/10/73	-
V-21272			-
V-21273	A	1/5/72	-
V-21274	F	6/1/73	-
V-21285	D	12/10/73	-
V-21290	A	3/25/71	-
V-21292	B	1/5/72	-
V-21293			-
V-21294			-
V-21295	A	8/9/71	-
V-21296	C	4/10/70	-
V-21297	B		-
V-21301	F	6/1/73	-
V-21311	A		-
V-21315	C	5/23/72	H
V-21320			H
V-21321	A	1/5/72	H
V-21322	G	3/8/72	H
V-21323	I	6/1/73	H
V-21324	I	6/1/73	H
V-21326	A	11/26/69	-
V-21327	C	1/5/72	-
V-21332	C	3/8/72	H
V-21333			-
V-21334			-
V-21337	A	1/5/72	-
V-21343	G	5/23/72	-
V-21345			-
V-21348	E	3/25/71	-
V-21349	B		-
V-21363	C	1/5/72	-
V-21371	H	6/1/73	-
V-21376	D	3/25/71	-
V-21379	A		-
V-21380	D	6/1/73	-
V-21386	B	10/5/72	H
V-21391			-
V-21392			-
V-21393			-
V-21394			-
V-21395			-
V-21398	E	3/25/71	-
V-21400	A	5/23/72	-
V-21406	B	6/17/70	-
V-21409	A	11/5/70	-
V-21411	C	5/23/72	-
V-21412	C	5/23/72	-

V-21415	G	3/16/73	-
V-21416			-
V-21418			-
V-21419	D	5/23/72	-
V-21420		1/30/69	-
V-21425	A	5/27/69	-
V-21426	B	4/10/70	-
V-21429	A	8/9/71	-
V-21430		4/15/69	-
V-21432	D	2/9/70	-
V-21434	B	10/5/72	-
V-21435	B	5/23/72	-
V-21437	A	2/9/70	H
V-21438	B	1/1/73	-
V-21439		8/22/69	-
V-21440		8/22/69	-
V-21441	A	11/5/70	-
V-21443	A	3/25/71	-
V-21444	A	3/25/71	-
V-21445	A	6/17/70	-
V-21446	D	5/23/72	-
V-21447		2/9/70	-
V-21448	C	5/23/72	-
V-21449	A	9/17/70	-
V-21450	B	3/25/71	-
V-21452	B	7/24/72	-
V-21453	A	8/9/71	-
V-21454	A	1/5/72	H
V-21455		9/17/70	-
V-21456		9/17/70	-
V-21457		9/17/70	-
V-21458	D	3/16/73	H
V-21459	B	1/5/72	-
V-21460	C	5/23/72	-
V-21462		11/5/70	-
V-21464	A	5/23/72	-
V-21465		1/21/71	-
V-21466	A	8/9/71	-
V-21467		3/25/71	-
V-21468		3/25/71	-
V-21469		3/25/71	-
V-21470	A	3/16/73	-
V-21471		3/25/71	-
V-21472		3/25/71	-
V-21473		3/25/71	-
V-21474	A	5/23/72	-
V-21478	D	10/4/74	-
V-21479	D	10/4/74	H
V-21480	A	6/1/73	-
V-21481	A	12/10/73	-
V-21482		8/9/71	-
V-21483		8/9/71	-
V-21484		8/9/71	-

V-21485		8/9/71	-
V-21486		8/9/71	-
V-21487		8/9/71	-
V-21488		1/5/72	-
V-21489	A	3/2/72	-
V-21490	D	6/1/73	-
V-21491		1/5/72	-
V-21492		1/5/72	-
V-21493	A	3/2/72	-
V-21494		1/5/72	-
V-21495		1/5/72	-
V-21496		1/5/72	-
V-21497	B	10/4/74	H
V-21498	A	3/2/72	-
V-21500	B	7/24/72	H
V-21501	A	6/1/73	-
V-21502	A	7/24/72	-
V-21503	A	7/24/72	-
V-21504	B	10/5/72	-
V-21505	B	7/24/72	-
V-21506	A	7/24/72	-
V-21507	B	3/16/73	-
V-21508	C	6/1/73	-
V-21509	B	7/24/72	-
V-21510	A	7/24/72	-
V-21511	B	3/16/73	-
V-21513	B	5/23/72	-
V-21514	D	6/1/73	-
V-21515	E	6/1/73	-
V-21516		1/5/72	-
V-21517	B	10/5/72	-
V-21518	A	2/9/73	-
V-21519	E	6/1/73	-
V-21520	A	6/1/73	-
V-21522		1/5/72	-
V-21523	A	5/23/72	-
V-21524	B	2/9/73	-
V-21525	A	7/24/72	-
V-21526	A	7/24/72	-
V-21527	A	5/23/72	-
V-21528		3/2/72	-
V-21529	B	6/1/73	H
V-21530	B	6/1/73	H
V-21531		3/2/72	H
V-21532	D	3/16/73	H
V-21533		3/2/72	-
V-21534		3/2/72	-
V-21535		3/2/72	-
V-21536	A	10/4/74	-
V-21537	A	10/4/74	-
V-21538	A	3/16/73	-
V-21539		3/2/72	-
V-21540		3/2/72	-

V-21541		5/23/72	-
V-21542		3/2/72	-
V-21543		3/2/72	-
V-21544		5/23/72	-
V-21545		5/23/72	-
V-21546	D	12/10/73	-
V-21553	A	6/1/73	H
V-21554		10/5/72	-
V-21555	B	2/9/73	-
V-21556		10/5/72	-
V-21557		10/5/72	-
V-21558		10/5/72	-
V-21559		10/5/72	-
V-21560	A	1/1/73	-
V-21561		10/5/72	-
V-21562		10/5/72	H
V-21563		10/5/72	-
V-21564	B	10/4/74	-
V-21565		1/1/73	-
V-21566		1/1/73	-
V-21568		1/1/73	-
V-21569	A	8/8/73	-
V-21570		1/1/73	-
V-21571		1/1/73	-
V-21572		1/1/73	-
V-21574	A	10/4/74	-
V-21575			-
V-21576			-
V-21582		6/1/73	-
V-21583		10/4/74	H
V-21584		10/4/74	-
V-22005	A	3/2/72	-
V-22006	D	10/5/72	-
V-22013	B	5/23/72	-
V-22014	D	5/23/72	-
V-22015		5/23/72	-
V-23011	B	2/9/70	-
V-23012	A		-
V-23013	F	10/5/72	-
V-23014	I	3/2/72	-
V-23015	B		-
V-23017	B	2/9/70	-
V-23018	C	8/22/69	H
V-23025	C	4/10/70	-
V-23026			-
V-23027			-
V-23028	B	5/23/72	-
V-23029	K	1/5/72	-
V-23030	I	10/4/74	-
V-23048	F	12/10/73	-
V-23049	F	8/8/73	-
V-23059	E	5/23/72	-
V-23061	F	5/23/72	-

V-23062	E	5/23/72	-
V-23066	G	5/23/72	-
V-23068	G	5/23/72	-
V-23069	D	8/9/71	-
V-23123	E	1/5/72	H
V-23124	B	3/2/72	H
V-23125	E	5/23/72	H
V-23126	A	8/22/69	H
V-23137	B	8/12/69	-
V-23143			-
V-23144	A		-
V-23145	A	1/30/69	-
V-23146	A		-
V-23147	A		-
V-23148	A		-
V-23150	A		-
V-23153	J	5/23/72	-
V-23155	F	10/4/74	-
V-23159	A		-
V-23160	C	1/5/72	-
V-23169	F	5/23/72	-
V-23171	G	7/21/69	-
V-23173			-
V-23178	D	5/23/72	-
V-23179	A		-
V-23180	B	7/24/72	-
V-23181	B	11/1/69	-
V-23182	B	11/1/69	-
V-23183	C	2/9/70	-
V-23185	E	10/5/72	-
V-23187	B	2/9/70	-
V-23188	C	2/9/70	-
V-23190	E	12/10/73	-
V-23191			-
V-23192			-
V-23195	A	8/9/71	-
V-23197	A	5/23/72	-
V-23198	B	10/4/74	-
V-23199	E	10/5/72	-
V-23200	C	8/8/73	-
V-23212		3/25/71	-
V-23213	A	12/10/73	H
V-23214	A	12/10/73	-
V-23215	A	5/23/72	-
V-23217	B	8/9/71	-
V-23218	A	6/8/74	-
V-23219	A	6/8/74	-
V-23220	A	6/8/74	-
V-23221	A	10/4/74	-
V-23222	A	10/4/74	-
V-23223	A	10/4/74	-
V-23224		8/9/71	-
V-23225	A	10/4/74	-

V-23226	A	10/4/74	-
V-23227		8/9/71	-
V-23228		8/9/71	-
V-23229	A	12/10/73	-
V-23230	A	5/23/72	-
V-23232	A	8/9/71	-
V-23234		4/10/70	-
V-23235	B	5/23/72	-
V-23236		8/9/71	-
V-23237	B	6/3/74	-
V-23238	A	1/5/72	-
V-23239		8/9/71	-
V-23240		8/9/71	-
V-23241		8/9/71	-
V-23242		8/9/71	-
V-23243		8/9/71	-
V-23244	A	12/10/73	-
V-23245		8/9/71	-
V-23246		8/9/71	-
V-23247	B	12/10/73	-
V-23248	B	12/10/73	-
V-23249	A	12/10/73	-
V-23250	A	12/10/73	-
V-23251	A	12/10/73	-
V-23252		8/9/71	-
V-23253		8/9/71	-
V-23254	B	12/10/73	-
V-23255		8/9/71	-
V-23256	A	12/10/73	-
V-23257		8/9/71	-
V-23258	A	3/2/72	-
V-23259	B	3/26/73	-
V-23260	A	10/4/74	-
V-23261	B	10/4/74	-
V-23262	A	10/4/74	-
V-23263	A	10/4/74	-
V-23264	A	1/5/72	-
V-23265	A	7/24/72	-
V-23266	B	10/4/74	-
V-23267	A	10/4/74	-
V-23268	A	10/4/74	-
V-23269	A	10/4/74	-
V-23270	C	6/1/73	H
V-23271		1/5/72	-
V-23272		1/5/72	-
V-23273		1/5/72	-
V-23274		1/5/72	-
V-23275	A	10/4/74	-
V-23276	D	10/4/74	H
V-23277		1/5/72	-
V-23278		5/23/72	-
V-23279	B	10/4/74	-
V-23280	A	10/4/74	-

V-23281	B	10/4/74	"
V-23282	C	10/4/74	"
V-23283		5/23/72	"
V-23284		5/23/72	"
V-23285		5/23/72	"
V-23286		5/23/72	"
V-23287		5/23/72	"
V-23288	B	3/16/73	"
V-23289	A	8/8/73	"
V-23290		10/5/72	"
V-24000			"
V-24001	B		H
V-24002	A		H
V-24003	A		H
V-24004	A		H
V-24005	A		H
V-24006	B		H
V-24009	C	5/27/69	H
V-24010	B		H
V-24011	B		H
V-24012	A		H
V-24014	A		H
V-24016			"
V-24017	A		H
V-24018	E	1/5/72	H
V-24019	H	3/2/72	H
V-24020	D	9/17/70	H
V-24022	C	3/25/71	"
V-24024	E	3/25/71	H
V-24025	A		H
V-24026	F	9/17/70	H
V-24028	B	3/25/71	H
V-24029	B	3/25/71	H
V-24030	B	3/25/71	H
V-24032	B	3/25/71	H
V-24034	C	3/25/71	H
V-24035	B	1/5/72	"
V-24036	A		H
V-24038	C	3/25/71	"
V-24039	C	3/25/71	"
V-24040	F	1/5/72	"
V-24044	D	10/5/72	H
V-24045	D	3/25/71	H
V-24048	D	3/25/71	H
V-24049	E	1/5/72	H
V-24065	C	8/9/71	H
V-24073	B	8/9/71	H
V-24076	C	8/9/71	H
V-24078	C	8/9/71	"
V-24080	C	8/9/71	"
V-24081	C	8/9/71	H
V-24083	B	8/9/71	H
V-24084	C	11/5/70	H

V-24086	D	5/23/72	-
V-24088	C	5/23/72	H
V-24091	D	1/5/72	-
V-24092	G	3/16/73	-
V-24095	D	1/5/72	H
V-24098	G	12/10/73	H
V-24100	C	5/23/72	H
V-24101	D	8/9/71	H
V-24106	H	1/5/72	-
V-24107	G	1/5/72	-
V-24109	D	5/23/72	H
V-24110	G	3/25/71	-
V-24111	C	3/25/71	H
V-24113	D	8/12/69	H
V-24115	D	8/9/71	H
V-24116	G	9/17/70	-
V-24120	D	8/9/71	H
V-24124	G	3/2/72	H
V-24125	J	7/24/72	-
V-24126	G	5/23/72	-
V-24153	A		H
V-24154			H
V-24160	F	2/9/70	-
V-24167	A	1/5/72	H
V-24168	A	3/10/69	H
V-24177	B	8/9/71	H
V-24180	B	3/25/71	H
V-24181	A		H
V-24182	B	8/9/71	H
V-24183	C	8/9/71	H
V-24184	C	8/9/71	H
V-24185	C	2/9/73	-
V-24186	H	1/5/72	H
V-24189	G	1/5/72	H
V-24190	B	8/9/71	H
V-24192	D	3/25/71	H
V-24193	B	3/16/73	-
V-24201	C	3/16/73	-
V-24202	C	3/16/73	-
V-24203	B	3/25/71	-
V-24204	B	3/25/71	-
V-24223	F	10/4/74	H
V-24225			H
V-24228	K	10/4/74	-
V-24235	D	3/25/71	H
V-24236	C	3/25/71	H
V-24237	E	7/24/72	H
V-24238	E	7/24/72	H
V-24240	A	3/25/71	H
V-24243	F	10/5/72	H
V-24244	H	6/17/70	-
V-24245	E	3/25/71	-
V-24246	H	6/1/73	H

V-24247	E	3/16/73	H
V-24248	G	3/25/71	H
V-24250	H	3/25/71	H
V-24253	B	6/17/70	H
V-24254	B	6/17/70	H
V-24257	F	3/2/72	-
V-24258	C	2/9/70	H
V-24260	A		-
V-24261	G	3/25/71	-
V-24263	F	7/24/72	H
V-24266	C	2/9/70	-
V-24267	D	3/25/71	H
V-24269	A	6/9/71	H
V-24270	H	2/9/73	-
V-24271	A	3/25/71	-
V-24273	B	3/25/71	H
V-24275	B	9/17/70	H
V-24276	F	1/1/73	-
V-24295	D	6/9/71	-
V-24298	F	10/4/74	H
V-24299	G	10/4/74	H
V-24300	E	1/5/72	-
V-24303	F	10/5/72	-
V-24304			-
V-24305	D	3/16/73	H
V-24307	B		H
V-24308	C	5/27/69	H
V-24309	E	3/25/71	-
V-24310	D	3/25/71	H
V-24311	F	3/25/71	H
V-24312	E	3/25/71	H
V-24314	D	3/25/71	H
V-24316	C	5/27/69	H
V-24317	C	1/5/72	H
V-24318	D	3/25/71	-
V-24319	C	8/12/69	-
V-24320	B	8/12/69	-
V-24321	D	3/25/71	H
V-24322	A	11/1/69	H
V-24324	E	5/23/72	-
V-24326	G	5/23/72	-
V-24327	E	3/16/73	H
V-24329	A	8/9/71	H
V-24331	C	3/25/71	H
V-24332	B	3/25/71	H
V-24334	C	8/9/71	H
V-24335	B	8/9/71	H
V-24336	A	8/9/71	-
V-24337	C	2/9/73	H
V-24338	C	5/23/72	H
V-24340	H	1/5/72	H
V-24341	C	1/1/73	-
V-24342	C	3/25/71	H

V-24343	B	8/9/71	H
V-24344	K	3/16/73	=
V-24345	B	8/9/71	H
V-24347			=
V-24348	G	1/1/73	H
V-24352	C	3/25/71	H
V-24356	B	8/9/71	H
V-24357	F	3/2/72	H
V-24359			H
V-24361	I	3/2/72	H
V-24362	A	8/22/69	H
V-24363	D	1/5/72	H
V-24364	A	3/2/72	H
V-24367	A	3/2/72	H
V-24368	B	8/9/71	=
V-24369	C	5/23/72	H
V-24370	D	5/23/72	H
V-24372	A		H
V-24373	D	5/23/72	H
V-24374	C	5/23/72	H
V-24375	A	6/1/73	H
V-24376	A	3/25/71	H
V-24377	B	6/1/73	H
V-24378	B	8/9/71	=
V-24379		1/30/69	H
V-24380	A	8/12/69	H
V-24381	A	8/9/71	H
V-24382	B	8/9/71	H
V-24383	A	5/23/72	H
V-24386	D	3/25/71	=
V-24387	B	1/5/72	=
V-24388	B	8/9/71	=
V-24389	C	3/2/72	=
V-24390	B	8/9/71	H
V-24391	E	10/4/74	=
V-24392	C	8/9/71	H
V-24396	C	8/9/71	H
V-24397	A	8/9/71	H
V-24398	C	8/9/71	=
V-24401	A	3/25/71	H
V-24402	E	5/23/72	H
V-24403	A	5/23/72	=
V-24404	B	7/24/72	=
V-24405		4/10/70	H
V-24406		4/10/70	H
V-24407	E	10/4/74	=
V-24408	D	10/4/74	=
V-24409		6/17/70	H
V-24410	D	7/24/72	H
V-24411	A	3/25/71	=
V-24412	A	9/17/70	=
V-24415	A	9/17/70	H
V-24416		9/17/70	H

V-24417	E	2/9/73	H
V-24418	A	1/5/72	"
V-24419	A	3/2/72	H
V-24420	D	6/1/73	H
V-24421	C	5/23/72	H
V-24422	B	10/4/74	"
V-24424	A	3/25/71	H
V-24425	B	8/3/73	H
V-24426	A	6/1/73	"
V-24427	B	6/1/73	"
V-24428	F	5/23/72	"
V-24429	B	7/24/72	H
V-24430		3/25/71	H
V-24431		3/25/71	"
V-24432		8/9/71	H
V-24433		8/9/71	H
V-24434		8/9/71	H
V-24435	B	10/4/74	"
V-24436	A	7/24/72	H
V-24437	C	10/4/74	H
V-24438		8/9/71	H
V-24439		8/9/71	H
V-24440	A	5/23/72	H
V-24441	A	5/23/72	H
V-24442	A	7/24/72	H
V-24443	B	10/4/74	"
V-24444	A	7/24/72	H
V-24445	B	10/4/74	"
V-24446	A	1/5/72	H
V-24447		8/9/71	"
V-24448		8/9/71	H
V-24449	A	7/24/72	H
V-24452	C	6/3/74	H
V-24453	A	5/23/72	"
V-24454	B	5/23/72	H
V-24455	B	6/3/74	"
V-24456	D	6/3/74	H
V-24457	A	5/23/72	"
V-24458		1/5/72	H
V-24459		1/5/72	"
V-24460		1/5/72	H
V-24461		1/5/72	"
V-24462	F	12/10/73	H
V-24464		1/5/72	H
V-24465		1/5/72	H
V-24466	A	5/23/72	H
V-24467	B	6/1/73	"
V-24468	E	6/1/73	H
V-24469	E	6/1/73	"
V-24470	B	2/9/73	H
V-24471	B	2/9/73	H
V-24472	A	3/16/73	H
V-24473	B	6/1/73	H

V-24474		1/5/72	-
V-24475	A	12/10/73	H
V-24476		1/5/72	-
V-24477		1/5/72	-
V-24478	A	5/23/72	-
V-24479	A	5/23/72	-
V-24480	A	5/23/72	-
V-24481	A	5/23/72	-
V-24482	A	5/23/72	-
V-24483	A	5/23/72	-
V-24484	A	5/23/72	-
V-24485	B	5/23/72	-
V-24486	A	5/23/72	-
V-24487	B	6/3/74	H
V-24489		3/2/72	H
V-24491		3/2/72	H
V-24492	A	7/24/72	H
V-24493	B	6/1/73	H
V-24494	A	7/24/72	H
V-24495		3/2/72	H
V-24497	D	10/4/74	-
V-24498	A	1/1/73	-
V-24499	E	10/4/74	H
V-24500	A	7/24/72	-
V-24501	A	2/9/73	H
V-24502	B	1/1/73	-
V-24503	D	1/1/73	-
V-24504	B	7/24/72	H
V-24505	A	6/1/73	H
V-24506	B	6/1/73	-
V-24507	A	5/23/72	-
V-24508	B	7/24/72	-
V-24509	A	6/1/73	-
V-24510	D	3/16/73	-
V-24511	B	3/16/73	-
V-24512		3/2/72	-
V-24513	B	1/1/73	-
V-24514		3/2/72	-
V-24515	B	6/1/73	H
V-24516	A	5/23/72	-
V-24517	E	2/9/73	-
V-24518		3/2/72	-
V-24519	A	5/23/72	-
V-24520	C	8/3/73	H
V-24521	A	3/16/73	H
V-24522	F	10/4/74	-
V-24523	B	1/1/73	-
V-24525	A	5/23/72	-
V-24526		3/2/72	-
V-24527	D	10/4/74	-
V-24528		3/2/72	H
V-24529		3/2/72	H
V-24530		3/2/72	H

V-24531	A	7/24/72	H
V-24532	C	6/1/73	H
V-24534	A	5/23/72	"
V-24535		3/2/72	H
V-24536	D	6/1/73	"
V-24537	B	10/4/74	H
V-24538		3/2/72	"
V-24539		3/2/72	H
V-24540	A	6/3/74	H
V-24541	B	7/24/72	H
V-24542		3/2/72	H
V-24543		3/2/72	H
V-24544	A	3/16/73	H
V-24545		3/2/72	H
V-24546	B	6/3/74	H
V-24547		5/23/72	"
V-24548	C	6/1/73	"
V-24549	A	7/24/72	"
V-24550	A	7/24/72	"
V-24551	A	7/24/72	H
V-24552	C	12/10/73	"
V-24553		5/23/72	H
V-24554	A	8/3/73	"
V-24555		5/23/72	"
V-24556		5/23/72	H
V-24559	B	8/5/73	"
V-24560		7/24/72	"
V-24561	B	10/4/74	"
V-24562		7/24/72	H
V-24563	A	12/10/73	"
V-24564	B	12/10/73	"
V-24568	A	8/3/73	H
V-24570		8/3/73	H
V-24571		12/10/73	H
V-24572		12/10/73	H
V-24573		12/10/73	H
V-24574		6/3/74	"
V-24575		6/3/74	H
V-24576		6/3/74	H
V-24577	A	6/3/74	"
V-24578		6/3/74	"
V-24579		10/4/74	"
V-25000	E	9/17/70	H
V-25001	C	5/23/72	"
V-25002	D	6/1/73	H
V-25003	B		"
V-25004	C		H
V-25005	D	1/5/72	"
V-25006	B		"
V-25007	B		H
V-25009	B	11/5/70	H
V-25010	B		"
V-25011	B		"

V-25012	B		=
V-25013	E	5/23/72	H
V-25014			=
V-25015	A		=
V-25016	B		=
V-25017	A		=
V-25018	D	5/23/72	=
V-25019	B		=
V-25020	B		=
V-25021	B		=
V-25023	B		=
V-25025	B		=
V-25026			=
V-25028	C	3/25/71	=
V-25029	C	3/2/72	H
V-25030			=
V-25032	C		H
V-25033	C	3/2/72	H
V-25034	B		H
V-25035	B	5/27/69	H
V-25036	C		H
V-25037	B		=
V-25041	B		=
V-25042	B		=
V-25044	B		=
V-25076	A		=
V-25077	B		=
V-25078	A		=
V-25090	A		=
V-25091	A		=
V-25092	A		=
V-25093	A		=
V-25094	A		=
V-25095	A		=
V-25098	A		=
V-25101	C	8/3/73	=
V-25102	B		=
V-25103	B		=
V-25104	B		=
V-25118	E	3/16/73	=
V-25119	G	10/5/72	=
V-25120	D	10/5/72	=
V-25128	C	10/5/72	=
V-25141			=
V-25142	B		=
V-25143	B		=
V-25144	A	3/2/72	H
V-25146	G	5/23/72	H
V-25148	E	3/25/71	=
V-25149	C	2/9/70	=
V-25151	F	5/23/72	=
V-25152			=
V-25153	A	5/23/72	H

V-25154	A	2/9/70	"
V-25155			"
V-25156			"
V-25157	A	5/23/72	"
V-25159	D	6/17/70	"
V-25160	B		"
V-25164	J	5/23/72	H
V-25167	A		"
V-25171	A		"
V-25172	B	10/5/72	"
V-25173	A		"
V-25174	D	10/5/72	"
V-25177	C	5/23/72	"
V-25178	B	1/5/72	"
V-25179	E	1/5/72	H
V-25180	E	11/17/70	H
V-25184	C		"
V-25186	B	7/21/69	"
V-25188	C	1/5/72	"
V-25242	F	3/25/71	H
V-25252	D	1/1/73	"
V-25258	A		"
V-25260	A		"
V-25271	D	3/2/72	H
V-25274	A		"
V-25276	C	3/2/72	"
V-25277	B	7/24/72	H
V-25279	C	3/2/72	H
V-25281	C	3/2/72	H
V-25282	B	3/2/72	"
V-25283	B	7/24/72	H
V-25284	C	3/2/72	"
V-25291	B		"
V-25296	A		"
V-25301	C	1/5/72	"
V-25302	A		"
V-25305	B	3/10/69	"
V-25311	F	1/5/72	"
V-25312	D	10/5/72	H
V-25318	C	11/5/70	"
V-25319	B		"
V-25320	C	2/9/70	H
V-25321	C	2/9/70	"
V-25322	C	3/2/72	"
V-25323	C	3/2/72	"
V-25324	C	7/24/72	"
V-25325	C	9/17/70	"
V-25326	C	9/17/70	"
V-25327	C	6/17/70	"
V-25328	D	8/9/71	H
V-25329	C	4/10/70	H
V-25330	C	11/5/70	H
V-25331	D	2/9/70	H

V-25332	C	6/17/70	-
V-25334	D	7/24/72	H
V-25335	C	1/21/71	H
V-25336	B		H
V-25337	C	9/17/70	H
V-25338	C	1/21/71	H
V-25339	B		-
V-25340	B		H
V-25341	D	7/24/72	H
V-25342	B		H
V-25343	D	10/5/72	-
V-25344	C		-
V-25345	B		H
V-25347	B	3/2/72	H
V-25348	A		-
V-25351	B	5/23/72	-
V-25353	B	10/5/72	-
V-25354			-
V-25355	C	10/5/72	-
V-25357	B	1/30/69	-
V-25358			-
V-25359	B		H
V-25363	A	1/30/69	-
V-25364	B	10/5/72	-
V-25365	C	10/5/72	-
V-25370	A	1/30/69	-
V-25371	B	10/5/72	-
V-25373	C	10/5/72	-
V-25374	A	3/10/69	-
V-25385	F	7/24/72	H
V-25386	C	10/5/72	-
V-25388	A		-
V-25389	G	3/2/72	H
V-25393			-
V-25394	C	2/9/70	H
V-25395	C	2/9/70	H
V-25396	C	7/24/72	H
V-25397	C	4/10/70	H
V-25398	A	7/24/72	H
V-25399	A	6/3/74	H
V-25400	A	8/3/73	H
V-25401	B	1/5/72	-
V-25402			-
V-25405			-
V-25406	F	1/5/72	H
V-25407	B	5/23/72	H
V-25408		8/2 /69	H
V-25409	B	10/5/72	-
V-25410	A	1/21/71	H
V-25411		1/5/72	-
V-25412		1/5/72	-
V-25413	A	5/23/72	H
V-25414		1/5/72	-

V-25415		1/5/72	"
V-25416		1/5/72	"
V-25417		1/5/72	"
V-25418	A	1/1/73	"
V-25420		3/2/72	"
V-25421		3/2/72	"
V-25422	A	10/5/72	H
V-25423	A	10/5/72	H
V-25424		3/2/72	"
V-25425		3/2/72	"
V-25427	A	10/5/72	"
V-25428	A	10/5/72	"
V-25429	A	10/5/72	"
V-25433	A	10/5/72	"
V-25434	A	10/5/72	"
V-25435	A	10/5/72	"
V-25436	A	10/5/72	"
V-25437	A	10/5/72	"
V-25438	A	10/5/72	"
V-25439	A	10/5/72	"
V-25440		5/23/72	"
V-25441		5/23/72	"
V-25442	A	1/1/73	"
V-25443		5/23/72	"
V-25444		5/23/72	H
V-25445		7/24/72	"
V-25446		10/5/72	"
V-25447		1/1/73	"
V-26001	B		"
V-26002	E	7/24/72	H
V-26003	H	7/24/72	H
V-26019			H
V-26025	B		H
V-26026			H
V-26031	B		H
V-26033	A	7/24/72	H
V-26034	A	7/24/72	H
V-26037	A	6/1/73	"
V-26038	A	1/5/72	"
V-26040	A		H
V-26045	A		H
V-26046	C	8/22/69	H
V-26047			"
V-26049			H
V-26050	A	1/30/69	H
V-26057			H
V-26062	B		H
V-26064			"
V-26070	A		H
V-26071	B		H
V-26072	B		H
V-26092			H
V-26093			H

V-26107	C	8/12/69	H
V-26108	B		"
V-26109	C	5/27/69	"
V-26110	A		"
V-26111	B		"
V-26112	B		"
V-26113	C	5/27/69	H
V-26115	E	5/23/72	H
V-26116	B	1/5/72	H
V-26118	D	5/23/72	"
V-26122	C	11/5/70	H
V-26125			H
V-26133			H
V-26130			"
V-26139	B	10/5/72	"
V-26165	B	8/9/71	H
V-26169	A		H
V-26178	C	5/23/72	H
V-26183			"
V-26184			"
V-26186			"
V-26196			H
V-26197	A	3/16/73	H
V-26198	A		H
V-26199	C	5/23/72	H
V-26200	C	5/23/72	H
V-26201	C	5/23/72	H
V-26202	E	5/23/72	H
V-26203	C	11/5/70	H
V-26204	F	5/23/72	H
V-26207	A	1/5/72	H
V-26209	A	11/5/70	H
V-26217	A	6/30/69	H
V-26218	C	10/5/72	H
V-26222	A	10/5/72	H
V-26223	A	1/5/72	H
V-26235	E	3/25/71	"
V-26243	C	5/23/72	H
V-26245	A		H
V-26247	D	8/12/69	H
V-26250			H
V-26261	C	6/3/74	H
V-26266			H
V-26267	A	3/2/72	"
V-26274	E	6/17/70	H
V-26276	G	3/2/72	"
V-26317	A	8/9/71	H
V-26323			"
V-26324	A		"
V-26327	C		"
V-26329	B	1/5/72	H
V-26333	C	5/23/72	"
V-26334	A	1/5/72	"

V-26336	A	1/5/72	H
V-26346	F	6/17/70	H
V-26351	C	2/9/73	H
V-26352			"
V-26353	B	9/17/70	H
V-26360	A		"
V-26362	A		"
V-26363	A		"
V-26365	A		"
V-26373	A		"
V-26377	B	1/30/69	H
V-26378			H
V-26379	A		H
V-26380	A	8/22/69	H
V-26381	A	8/22/69	H
V-26382	A	8/22/69	H
V-26383	A	8/22/69	H
V-26384	A	8/22/69	H
V-26386	B	5/27/69	H
V-26387	B	7/24/72	H
V-26388	A		H
V-26389	B	7/24/72	H
V-26390	A	5/27/69	H
V-26391	A	5/27/69	H
V-26394	B	8/12/69	"
V-26396	A	10/5/72	"
V-26399	A		H
V-26400	E	5/23/72	"
V-26401	G	8/9/71	H
V-26402	E	3/25/71	H
V-26403	E	3/25/71	H
V-26404	F	3/25/71	H
V-26405	E	3/25/71	H
V-26406	D	8/9/71	H
V-26407	F	3/25/71	H
V-26408	E	3/25/71	H
V-26409	E	3/25/71	H
V-26410	F	3/25/71	H
V-26411	E	3/25/71	H
V-26412	F	8/9/71	H
V-26413	B	1/30/69	"
V-26414	A		"
V-26415	A		"
V-26416	A		"
V-26417	F	3/25/71	H
V-26418	E	3/25/71	H
V-26419	E	3/25/71	H
V-26420	F	8/9/71	H
V-26421	F	3/25/71	H
V-26422	E	3/25/71	H
V-26423	E	3/25/71	H
V-26424	E	3/25/71	H
V-26431	B	1/5/72	H

V-26432			H
V-26433			H
V-26434			"
V-26435	A		H
V-26436			"
V-26437	B	3/25/71	"
V-26438	C	3/25/71	H
V-26439			"
V-26441	D	5/23/72	H
V-26442			H
V-26443	A	11/5/70	"
V-26444			"
V-26445	A	6/17/70	"
V-26446			"
V-26448			H
V-26449	D	3/2/72	"
V-26451			"
V-26452			"
V-26453			"
V-26454			H
V-26458			"
V-26459			"
V-26460	A	1/5/72	"
V-26461	C	2/9/73	"
V-26462	A	10/5/72	"
V-26463	B	3/25/71	H
V-26464	B	3/25/71	H
V-26465	B	3/2/72	H
V-26467	C	1/9/72	H
V-26468	C	1/5/72	H
V-26469	D	8/9/71	"
V-26470	B	3/25/71	"
V-26472	B	11/5/70	H
V-26473	C	3/25/71	"
V-26474	E	8/9/71	"
V-26475	B	1/5/72	H
V-26476	A	1/5/72	"
V-26478	A	6/17/70	H
V-26479	A	1/9/72	H
V-26480		5/27/69	H
V-26481	A	1/5/72	"
V-26482	B	1/5/72	H
V-26483	B	6/17/70	H
V-26484		8/12/69	"
V-26485		8/22/69	"
V-26486		11/26/69	H
V-26487		11/26/69	H
V-26488	B	3/25/71	"
V-26491	D	10/4/74	"
V-26492	D	10/4/74	"
V-26493	A	11/5/70	H
V-26494	B	6/1/73	H
V-26495		6/17/70	H

V-26496	B	1/5/72	H
V-26497	E	10/4/74	"
V-26500		9/17/70	H
V-26501		9/17/70	"
V-26502		9/17/70	"
V-26503		9/17/70	"
V-26504		9/17/70	"
V-26505		9/17/70	"
V-26506	A	7/24/72	"
V-26507		1/21/71	H
V-26508		1/21/71	H
V-26509	A	5/23/72	"
V-26510	A	5/23/72	H
V-26511	A	8/9/71	H
V-26512		3/25/71	"
V-26513	A	8/9/71	"
V-26514	A	1/5/72	"
V-26515	C	7/24/72	H
V-26516	A	7/24/72	H
V-26517	B	5/23/72	"
V-26519	C	3/8/72	"
V-26520	C	8/9/71	"
V-26521	C	8/9/71	"
V-26522	B	8/9/71	H
V-26523	C	8/9/71	"
V-26524	B	8/9/71	H
V-26525	C	8/9/71	"
V-26526	C	5/23/72	"
V-26527		1/5/72	H
V-26528	B	3/16/73	"
V-26529	A	7/24/72	H
V-26530	B	7/24/72	"
V-26531	A	7/24/72	H
V-26532	C	6/1/73	"
V-26533 (CANCEL)	A	10/4/74	"
V-26534		8/9/71	H
V-26535		8/9/71	"
V-26536	A	5/23/72	"
V-26537		8/9/71	H
V-26538	A	3/16/73	"
V-26539		8/9/71	"
V-26540	A	8/9/71	"
V-26541	B	1/5/72	"
V-26542	A	1/5/72	"
V-26543		8/9/71	"
V-26544		8/9/71	"
V-26545	A	5/23/72	"
V-26546		1/5/72	H
V-26547	A	10/4/74	H
V-26548	C	10/4/74	"
V-26549	D	10/4/74	H
V-26550	A	1/5/72	H
V-26551	A	1/5/72	"

V-26552	A	7/24/72	-
V-26553		1/5/72	-
V-26554	B	6/1/73	H
V-26555	A	7/24/72	H
V-26556	A	7/24/72	H
V-26557		1/5/72	-
V-26558		1/5/72	-
V-26559	A	1/5/72	-
V-26560		1/5/72	-
V-26561	B	2/9/73	-
V-26562		1/5/72	-
V-26564		1/5/72	H
V-26565		1/5/72	H
V-26566		1/5/72	H
V-26567		1/5/72	H
V-26568	A	7/24/72	-
V-26569	A	7/24/72	-
V-26570	A	7/24/72	-
V-26571	A	7/24/72	-
V-26572	A	7/24/72	-
V-26573	A	7/24/72	-
V-26574	A	1/1/73	H
V-26575		1/5/72	H
V-26577	A	7/24/72	-
V-26578	A	7/24/72	-
V-26579	A	3/2/72	H
V-26580	A	3/2/72	H
V-26581	A	3/2/72	H
V-26582	A	3/2/72	H
V-26583		1/5/72	-
V-26584		1/5/72	-
V-26585		1/5/72	-
V-26586	A	3/2/72	H
V-26587	A	3/2/72	H
V-26588	A	7/24/72	H
V-26589	A	7/24/72	-
V-26590	A	7/24/72	-
V-26591		1/5/72	H
V-26592		1/5/72	H
V-26593		1/5/72	-
V-26594		1/5/72	-
V-26595	A	7/24/72	-
V-26596	A	6/1/73	H
V-26599	A	5/3/73	H
V-26600	B	12/10/73	H
V-26601		3/2/72	H
V-26602	A	1/1/73	H
V-26603		3/2/72	H
V-26605	A	6/1/73	H
V-26606	A	5/23/72	H
V-26608		5/23/72	-
V-26609	A	6/1/73	H
V-26612		5/23/72	-

V-26614		5/23/72	H
V-26615		5/23/72	H
V-26616		5/23/72	H
V-26617	A	8/3/73	-
V-26618		5/23/72	H
V-26620		5/23/72	H
V-26622		7/24/72	-
V-26624	A	12/10/73	-
V-26625		2/9/73	H
V-26627		2/9/73	H
V-26628		2/9/73	-
V-26629	A	6/1/73	H
V-26630		6/1/73	H
V-26631		6/1/73	H
V-26632		6/1/73	H
V-26633		6/1/73	H
V-26634		6/1/73	H
V-26635		6/1/73	H
V-26636		6/1/73	H
V-26637		6/1/73	H
V-26638		6/1/73	H
V-26639		6/1/73	-
V-26640		6/1/73	-
V-26641		6/1/73	-
V-26642		6/1/73	-
V-26643		6/1/73	H
V-26644		6/1/73	H
V-26645		6/1/73	H
V-26646		6/1/73	H
V-26647		6/1/73	H
V-26648		6/1/73	H
V-26649	A	12/10/73	H
V-26650		6/1/73	H
V-26651		6/1/73	H
V-26652		6/1/73	H
V-26653	A	12/10/73	H
V-26654		6/1/73	H
V-26655		6/1/73	H
V-26656		6/1/73	H
V-26657		6/1/73	H
V-26658		6/1/73	H
V-26659		6/1/73	H
V-26660		6/1/73	H
V-26661	A	12/10/73	H
V-26662		6/1/73	H
V-26663		6/1/73	H
V-26664		6/1/73	H
V-26665		6/1/73	H
V-26666		6/1/73	H
V-26667		6/1/73	H
V-26668		6/1/73	H
V-26669		6/1/73	H
V-26670		6/1/73	H

V-26671		6/1/73	H
V-26672		6/1/73	H
V-26673		6/1/73	H
V-26674		8/3/73	H
V-26675		8/3/73	H
V-26676		8/3/73	H
V-26677		8/3/73	H
V-26678		8/3/73	"
V-26679		8/3/73	"
V-26680		6/3/74	H
V-26681	A	6/3/74	H
V-26682	A	6/3/74	H
V-26683	B	10/4/74	H
V-27009	A	9/17/70	"
V-27024	B	8/12/69	"
V-27025	B	7/24/72	"
V-27027	B	8/12/69	"
V-27029	G	3/2/72	"
V-27030	A	9/17/70	"
V-27031	A	9/17/70	"
V-27032	A	9/17/70	"
V-27033	A	9/17/70	"
V-27034	A	9/17/70	"
V-27035	B	9/17/70	"
V-27036	A	9/17/70	"
V-27038	C	9/17/70	"
V-27040	C	3/16/73	"
V-27047	B	9/17/70	"
V-27056	I	3/16/73	"
V-27058	H	3/16/73	"
V-27060	J	3/16/73	"
V-27061	H	3/16/73	"
V-27062	I	3/16/73	"
V-27063	J	3/16/73	"
V-27064	J	3/16/73	"
V-27065	J	3/16/73	"
V-27066	J	3/16/73	"
V-27067	G	5/23/72	"
V-27068	I	2/9/73	"
V-27071	A	9/17/70	"
V-27077	B	12/10/73	"
V-27079	B	7/24/72	"
V-27087	C	3/2/72	"
V-27092	A		"
V-27093	E	7/24/72	"
V-27094	D	3/25/71	"
V-27095	B	8/9/71	"
V-27096	A	8/9/71	"
V-27098	A	1/21/71	"
V-27099	A	8/9/71	"
V-27104	C	7/24/72	"
V-27104	E	7/24/72	"
V-27110			"

V-27111	B	2/9/70	-
V-27112	B	2/9/70	-
V-27113	E	5/23/72	-
V-27114	C	3/25/71	-
V-27115	E	2/9/73	-
V-27118	A	8/22/69	-
V-27122	B	2/9/70	-
V-27137	B	9/17/70	-
V-27138	B	9/17/70	-
V-27139	E	7/24/72	-
V-27143	B	8/9/71	-
V-27145	F	5/23/72	-
V-27148	E	2/9/73	-
V-27149	E	3/25/71	-
V-27151	D	3/25/71	H
V-27153	B		-
V-27154	B	9/17/70	-
V-27156	D	8/9/71	-
V-27166	A	8/9/71	-
V-27167	A	8/9/71	-
V-27169	A	8/9/71	-
V-27170	A	8/9/71	-
V-27171	A	8/9/71	-
V-27172	A	8/9/71	-
V-27173	A	8/9/71	-
V-27175	C	1/5/72	-
V-27183	B	11/01/69	-
V-27184	A	3/25/71	H
V-27185	A	3/25/71	H
V-27188	A	3/25/71	H
V-27189	A	3/25/71	-
V-27190	E	3/2/72	H
V-27191	E	12/10/73	-
V-27193	B	1/5/72	-
V-27194			-
V-27195	D	3/25/71	-
V-27196	D	7/24/72	-
V-27197	G	2/9/73	-
V-27198	B	1/5/72	-
V-27199	D	3/2/72	-
V-27200	A	2/9/70	-
V-27201	A	8/9/71	-
V-27202	C	1/5/72	-
V-27203	B	6/17/70	H
V-27204	A	9/17/70	-
V-27206	E	1/5/72	-
V-27208	A	3/2/72	-
V-27209	A	1/5/72	-
V-27211	A	9/17/70	-
V-27212	A	9/17/70	-
V-27213	B	5/23/72	-
V-27214	A	2/9/70	-
V-27215		7/21/69	-

V-27219	C	3/16/73	"
V-27222		4/10/70	"
V-27223	C	2/9/73	"
V-27224	A	3/25/71	"
V-27225	A	5/23/72	"
V-27226		9/17/70	"
V-27227		11/5/70	"
V-27228		11/5/70	"
V-27229		8/9/71	"
V-27230	B	3/16/73	"
V-27231		8/9/71	"
V-27232	A	1/1/73	"
V-27233	B	10/5/72	"
V-27234		1/5/72	"
V-27235		1/5/72	"
V-27236	A	12/10/73	"
V-27237	A	7/24/72	"
V-27238	A	12/10/73	"
V-27239		1/5/72	"
V-27240		1/5/72	"
V-27241		1/5/72	"
V-27242		1/5/72	"
V-27244		1/5/72	"
V-27245		3/2/72	"
V-27246	A	2/9/73	H
V-27247		3/2/72	"
V-27248	A	5/23/72	"
V-27249	B	8/3/73	"
V-27250	B	10/4/74	"
V-27251		10/5/72	"
V-28003 (CANCEL)	C	10/4/74	"
V-28004 (CANCEL)	C	10/4/74	"
V-28005	C	10/4/74	"
V-28008 (CANCEL)	C	10/4/74	"
V-28009 (CANCEL)	B	10/4/74	"
V-28011	D	2/9/70	"
V-28012	D	8/12/69	"
V-28013	E	1/21/71	"
V-28014	G	8/12/69	"
V-28016	E	9/17/70	"
V-28019			"
V-28023	C	5/27/69	H
V-28024	A		"
V-28027			"
V-28029	E	4/10/70	"
V-28031	E	3/25/71	"
V-28032	A		"
V-28035	D	6/1/73	"
V-28037	I	6/8/74	"
V-28044	C	8/9/71	"
V-28046	C	5/23/72	"
V-28047	C	2/9/73	"
V-28048	A	8/22/69	"

V-28049		I	5/23/72
V-28050		H	5/23/72
V-28051		I	10/5/72
V-28053		E	9/17/70
V-28054		D	10/4/74
V-28055		E	10/4/74
V-28056		G	10/4/74
V-28059		E	1/21/71
V-28060		C	6/20/69
V-28061		B	6/20/69
V-28062		C	6/20/69
V-28063		D	1/1/73
V-28065		B	5/27/69
V-28067		C	1/21/71
V-28068		B	1/5/72
V-28069		B	3/25/71
V-28070		D	10/4/74
V-28072		D	6/17/70
V-28074		G	10/5/72
V-28083		C	1/1/73
V-28085		B	5/23/72
V-28086		C	3/16/73
V-28088		A	5/23/72
V-28089		A	5/23/72
V-28090		A	5/23/72
V-28091		A	5/23/72
V-28092		B	5/23/72
V-28098		B	1/5/72
V-28102		B	3/25/71
V-28105		H	5/23/72
V-28106		A	2/9/70
V-28109			
V-28120		D	1/1/73 H
V-28121		F	2/9/73
V-28126		C	3/25/71
V-28127		D	1/5/72
V-28128		D	8/9/71
V-28135		B	8/9/71
V-28138		C	8/9/71
V-28139		C	3/25/71
V-28140		C	3/25/71
V-28141		C	3/25/71
V-28142		G	3/2/72
V-28144		B	11/5/70
V-28145		C	3/25/71
V-28146		B	12/10/73
V-28147		A	9/17/70
V-28150	(CANCEL)	C	10/4/74
V-28152		B	6/1/73
V-28153		B	3/25/71
V-28154		A	8/9/71
V-28156		A	8/9/71
V-28160		A	8/9/71

V-28161		A	8/9/71	-
V-28162		A	8/9/71	-
V-28163		A	8/9/71	-
V-28164		B	8/9/71	-
V-28165		A	8/9/71	-
V-28167		A	8/9/71	-
V-28168		A	8/9/71	-
V-28169		A	8/9/71	-
V-28170		A	8/9/71	-
V-28171		C	3/25/71	-
V-28172		B	1/5/72	-
V-28175		B	3/25/71	H
V-28177		C	8/12/69	-
V-28180				-
V-28181		A	10/5/72	-
V-28182			3/10/69	-
V-28184	(CANCEL)	B	10/4/74	-
V-28185		B	5/23/72	-
V-28186		B	9/17/70	-
V-28187		E	5/23/72	-
V-28188		B	5/23/72	-
V-28189			9/17/70	-
V-28190			9/17/70	-
V-28191			9/17/70	-
V-28193			11/10/71	-
V-28194		A	5/23/72	-
V-28195		A	5/23/72	-
V-28196		A	5/23/72	-
V-28197		A	1/1/73	-
V-28198		A	10/5/72	-
V-28199		B	6/3/74	-
V-28200		A	10/5/72	-
V-28201			1/5/72	-
V-28202		A	7/24/72	-
V-28203		B	10/4/74	-
V-28204		A	6/1/73	-
V-28205		A	10/4/74	-
V-28206			1/5/72	-
V-28207			1/5/72	-
V-28208			1/5/72	-
V-28209		A	6/1/73	-
V-28210		A	7/24/72	-
V-28211		B	6/3/74	-
V-28212		A	6/3/74	-
V-28213		A	5/23/72	-
V-28214		B	6/1/73	-
V-28215			1/5/72	-
V-28216			1/5/72	H
V-28217			1/5/72	-
V-28218		B	10/4/74	-
V-28219			1/5/72	-
V-28220			1/5/72	-
V-28221		A	2/9/73	-

V-28222		3/2/72	-
V-28223	B	10/4/74	-
V-28224	A	6/1/73	-
V-28225		3/2/72	-
V-28226	A	2/9/73	-
V-28227		5/23/72	-
V-28228	A	7/24/72	-
V-28229		7/24/72	-
V-28230		7/24/72	-
V-28231		7/24/72	-
V-28232	A	10/4/74	-
V-28233	A	10/4/74	-
V-28234	A	1/1/73	-
V-28235		7/24/72	-
V-28236		7/24/72	-
V-28237		7/24/72	-
V-28238		10/5/72	-
V-28239		10/5/72	-
V-28240		1/1/73	-
V-28241		1/1/73	-
V-28243		2/9/73	-
V-28250		8/8/73	H
V-29000	A		H
V-29001	A		H
V-29002	A		H
V-29003	B		H
V-29005			H
V-29020	C	3/25/71	H
V-29021	C	3/25/71	H
V-29023	D	2/9/73	H
V-29024	C	3/25/71	H
V-29027	H	2/9/73	H
V-29028	J	1/1/73	H
V-29029	D	1/1/73	-
V-29030	E	11/5/70	-
V-29033	D	6/1/73	H
V-29037	I	10/5/72	H
V-29038	E	2/9/73	-
V-29048	E	3/25/71	-
V-29049	D	2/9/73	H
V-29050	C	3/25/71	H
V-29053	D	7/24/72	H
V-29054	B	7/24/72	-
V-29054	C	5/23/72	-
V-29056	C	1/5/72	H
V-29058	B	3/25/71	H
V-29059	C	5/23/72	H
V-29060	D	7/24/72	-
V-29061	B	3/25/71	H
V-29062		8/12/69	H
V-29063	C	3/25/71	-
V-29064		9/17/70	-
V-29065	B	7/24/72	H

V-29113		E	3/2/72	H
V-29114		D	5/23/72	H
V-29115			3/25/71	-
V-29116		A	7/24/72	-
V-29117		A	7/24/72	-
V-29118		A	7/24/72	H
V-29119		A	6/1/73	H
V-29121			5/23/72	H
V-29122			1/5/72	H
V-29126			1/5/72	H
V-29128		A	2/9/73	H
V-29129			1/5/72	H
V-29130		C	6/1/73	H
V-29132			3/2/72	H
V-29133		D	12/10/73	-
V-29137		B	1/1/73	-
V-29138		B	1/1/73	-
V-29139		A	1/1/73	-
V-29140			6/1/73	H
V-29141			8/3/73	H
V-30003		H	1/21/71	-
V-30005		H	5/23/72	-
V-30008		D	6/1/73	-
V-30024		H	8/9/71	H
V-30026		A		H
V-30030		D	2/9/73	-
V-30032				-
V-30043		A		H
V-30046				H
V-30047				H
V-30048				H
V-30049				H
V-30050	(CANCEL)	A	10/4/74	H
V-30051		A		H
V-30052				H
V-30055				H
V-30057				H
V-30058		A		H
V-30059		A		H
V-30060		A		H
V-30061				H
V-30062		B		H
V-30063				H
V-30065				H
V-30066				H
V-30069				H
V-30071				H
V-30072				H
V-30073		A	11/5/70	-
V-30075		A	9/17/70	-
V-30076				H
V-30077				H
V-30078				H

V-30079		A	
V-30081		A	
V-30082			
V-30083		A	
V-30088		A	
V-30090		B	
V-30092			
V-30093			
V-30094		B	7/24/72
V-30095			
V-30096			
V-30097		A	
V-30098			
V-30100		A	
V-30101			
V-30103			
V-30105			
V-30106			
V-30108		A	1/5/72
V-30111			
V-30112			
V-30115	(CANCEL)	A	10/4/74
V-30117			
V-30118			
V-30119		A	
V-30120		A	
V-30121		A	
V-30122		A	
V-30124		A	
V-30126		A	
V-30127			
V-30129			
V-30130		A	
V-30132			
V-30134			
V-30135		A	1/30/69
V-30141		A	
V-30142		A	
V-30143		A	3/10/69
V-30146		A	
V-30147			
V-30148	(CANCEL)	A	10/4/74
V-30149	(CANCEL)	A	10/4/74
V-30150			
V-30151		A	
V-30152		A	
V-30153		A	11/5/70
V-30154		A	11/5/70
V-30156			
V-30157		A	11/5/70
V-30158		A	9/17/70
V-30160			
V-30161			

V-30164				H
V-30166	(CANCEL)	B	10/4/74	H
V-30170				H
V-30171		A		H
V-30174		A		H
V-30175		A		H
V-30180		A		H
V-30183				H
V-30184				H
V-30188				H
V-30189				H
V-30191				H
V-30198				H
V-30201		A		H
V-30210				H
V-30211				H
V-30215		A		H
V-30216		A	7/21/69	H
V-30217		A	7/24/72	H
V-30219				H
V-30220				H
V-30223				H
V-30224				H
V-30225				H
V-30227				H
V-30228				H
V-30230				H
V-30231		A	3/10/69	H
V-30233		A	1/5/72	H
V-30234				H
V-30235				H
V-30239				H
V-30244				H
V-30246				H
V-30247				H
V-30248				H
V-30249		A		H
V-30250				H
V-30251				H
V-30253		A		H
V-30255				H
V-30258		A		H
V-30262				H
V-30265		B	1/5/72	H
V-30267				H
V-30268				H
V-30269				H
V-30270		A		H
V-30274	(CANCEL)	A	10/4/74	H
V-30275		A		H
V-30280				H
V-30281				H
V-30282		A	1/5/72	H

V-30284				H
V-30288				H
V-30289				H
V-30291				H
V-30292				H
V-30294				H
V-30295		A		H
V-30299				H
V-30302				H
V-30305		A	3/85/71	H
V-30307		B	1/5/72	H
V-30309				H
V-30310		A		H
V-30312		A		H
V-30314		A		H
V-30315		A		H
V-30316		A		H
V-30317		A		H
V-30318		A		H
V-30319		B	1/5/72	H
V-30320		B	1/5/72	H
V-30321		A		H
V-30322		B	1/5/72	H
V-30325				H
V-30329				H
V-30330				H
V-30333				H
V-30342				H
V-30345				H
V-30346		B		H
V-30347				H
V-30348				H
V-30351		A		H
V-30352				H
V-30353				H
V-30358				H
V-30359				H
V-30361	(CANCEL)	B	10/4/74	H
V-30362				H
V-30369				H
V-30375		A		H
V-30377		A	6/3/74	H
V-30379				H
V-30381		A		H
V-30382				H
V-30383		A		H
V-30385				H
V-30386				H
V-30387				H
V-30393		A		H
V-30395		A		H
V-30396				H
V-30397				H

V-30398		A	1/5/72	H
V-30399				H
V-30400		A		H
V-30402		A		H
V-30404		A	1/5/72	H
V-30406		B	1/5/72	H
V-30407		A		H
V-30408		A		H
V-30410		A		H
V-30412				H
V-30416				H
V-30419	(CANCEL)	A	10/4/74	H
V-30420		B	6/5/74	H
V-30421		A		H
V-30423				H
V-30424		A		H
V-30425		A		H
V-30426		B		H
V-30428				H
V-30434		A		H
V-30436		A		H
V-30438		A		H
V-30439				H
V-30442		A		H
V-30443		A		H
V-30444				H
V-30446				H
V-30447				H
V-30448				H
V-30452	(CANCEL)	B	10/4/74	H
V-30454				H
V-30455				H
V-30457		A		H
V-30458				H
V-30459		B		H
V-30460				H
V-30461				H
V-30462				H
V-30463				H
V-30464				H
V-30466				H
V-30467				H
V-30469				H
V-30470				H
V-30478				H
V-30479		A	11/5/70	H
V-30482				H
V-30484				H
V-30485		A	1/5/72	H
V-30487		A		H
V-30490				H
V-30494		C	5/23/72	H
V-30495		E	1/5/72	H

V-30499	C	3/25/71	-
V-30502			H
V-30503			H
V-30504			H
V-30506			H
V-30508	A		H
V-30509			H
V-30510			H
V-30512			H
V-30514	A	1/30/69	H
V-30515			H
V-30517			H
V-30524			H
V-30526			H
V-30527			H
V-30528			H
V-30529			H
V-30530			-
V-30531	A	1/5/72	H
V-30532	A	1/5/72	H
V-30533	A	1/5/72	H
V-30534	C	9/17/70	-
V-30535	B	1/5/72	-
V-30539	I	3/2/72	H
V-30540			H
V-30541			H
V-30542			-
V-30543			H
V-30544	E	10/5/72	H
V-30545			H
V-30546			H
V-30547			H
V-30548			H
V-30550			H
V-30552			H
V-30553			H
V-30557		3/10/69	H
V-30558		3/10/69	H
V-30560	B	9/17/70	-
V-30563	A	8/12/69	-
V-30564	B	3/2/72	H
V-30565		6/20/69	H
V-30569		8/12/69	-
V-30571	A	1/5/72	-
V-30572		6/17/70	H
V-30573		6/17/70	H
V-30574		11/5/70	-
V-30575	B	3/25/71	H
V-30576	B	1/5/72	H
V-30577		1/21/71	H
V-30578		1/5/72	-
V-30579		1/5/72	H
V-30590	D	5/23/72	H

V-30593		3/2/72	H
V-30594		5/23/72	"
V-30602		5/23/72	"
V-30603		5/23/72	"
V-30604		5/23/72	"
V-30605		5/23/72	"
V-30606	A	8/8/73	"
V-30607		5/23/72	"
V-30608		5/23/72	"
V-30609		5/23/72	"
V-30610	D	6/8/74	H
V-30611		1/1/73	H
V-30613		2/9/73	H
V-31011	E	10/4/74	"
V-31012	G	5/23/72	"
V-31015	B	11/5/70	"
V-31025	E	8/9/71	H
V-31026	E	8/9/71	H
V-31028	C	3/2/72	H
V-31031	A	1/1/73	"
V-31032	C	1/5/72	"
V-31042	E	3/25/71	"
V-31045	D	1/5/72	"
V-31046	B	6/17/70	"
V-31047	D	1/5/72	"
V-31048			"
V-31049			"
V-31052	D	2/9/73	H
V-31056	C	8/9/71	"
V-31057	A	1/5/72	"
V-31062	C	9/17/70	H
V-31063	D	2/9/73	"
V-31064		6/17/70	"
V-31065		6/17/70	"
V-31066		6/17/70	"
V-31067	A	3/25/71	"
V-31108	D	10/4/74	"
V-31109		1/5/72	"
V-31110		1/5/72	H
V-31112	D	12/10/73	H
V-31114	A	1/1/73	"
V-31115		1/5/72	"
V-31116	A	7/24/72	"
V-31117	D	6/1/73	"
V-31118	B	3/16/73	H
V-31119		5/23/72	H
V-31120		3/2/72	"
V-31121		5/23/72	"
V-31122		5/23/72	"
V-31123		5/23/72	"
V-31124		5/23/72	"
V-31125	A	1/1/73	"
V-31126		5/23/72	"

V-31127			7/24/72	-
V-31129		B	2/9/73	-
V-31130			10/5/72	-
V-31131			10/5/72	-
V-31133		A	2/9/73	-
V-31134			10/5/72	-
V-31135			10/5/72	-
V-31138		A	3/16/73	-
V-32000		A	3/2/72	-
V-32001		C	3/16/73	H
V-32045			10/5/72	-
V-33011		G	5/23/72	-
V-33013		F	8/3/73	-
V-33021		H	2/9/73	-
V-33029		C	11/26/69	-
V-33030		E	1/5/72	-
V-33032		D	10/5/72	-
V-33033		D	10/5/72	-
V-33034		D	5/23/72	-
V-33035		A	7/24/72	-
V-33036		A	7/24/72	-
V-33037		A	7/24/72	-
V-33053				-
V-33055	(CANCEL)	A	6/3/74	-
V-34008		E	9/17/70	H
V-34010		C	3/2/72	-
V-34011		C	3/2/72	-
V-34012				H
V-34013		B	6/17/70	-
V-34014		K	2/9/73	H
V-34015				-
V-34016		C	1/5/72	H
V-34017		E	10/4/74	-
V-34030		C	1/5/72	H
V-34041		E	1/5/72	-
V-34044		A	3/2/72	-
V-34045		C	5/23/72	-
V-34046		F	10/4/74	H
V-34047		I	10/4/74	-
V-34048		B	3/25/71	-
V-34050		A	5/23/72	-
V-34051		A	5/23/72	-
V-34052		B	7/24/72	H
V-34053		B	10/4/74	-
V-34054		A	5/23/72	-
V-34055		A	5/23/72	-
V-34056			5/23/72	-
V-35002		B		-
V-35003		B		-
V-35004		B		-
V-35015		D	8/3/73	H
V-35017			6/17/70	-
V-35018			9/17/70	-

V-35019		9/17/70	"
V-35020	A	6/1/73	"
V-36000			"
V-36001	E	1/5/72	H
V-36003	D	8/22/69	H
V-36004	B	4/15/69	H
V-36011			"
V-36014			"
V-36015			"
V-36023		3/10/69	"
V-36025			"
V-36026	B	1/5/72	"
V-36028	A		"
V-36029	C		H
V-36030	C	7/24/72	"
V-36031	A	1/5/72	"
V-36032	A	1/5/72	"
V-36033			H
V-36034			H
V-36035			H
V-36036			H
V-36037			H
V-36038	G	10/4/74	"
V-36039	C	1/5/72	H
V-36040	B	3/10/69	H
V-36042			H
V-36043	E	10/5/72	"
V-36044			"
V-36045	C	3/10/69	H
V-36046	C	10/4/74	"
V-36048	C	5/23/72	H
V-36052	A		"
V-36053	B	1/5/72	
V-36053	D	7/24/72	"
V-36054	B	1/5/72	"
V-36055	B	1/5/72	"
V-36057	B	1/5/72	"
V-36063	C	10/5/72	H
V-36064	B	10/5/72	"
V-36065	C	8/9/71	"
V-36066	C	8/9/71	"
V-36068	B	7/24/72	"
V-36069	C	1/5/72	H
V-36070	A		H
V-36071	C	7/24/72	"
V-36073	E	1/5/72	"
V-36074	D	1/5/72	H
V-36077	C	1/5/72	"
V-36078	C	1/5/72	"
V-36079	A		"
V-36080	C	1/5/72	"
V-36081	C	1/5/72	"
V-36082	C	1/5/72	"

V-36084	C		-
V-36085	B		H
V-36086	C	1/5/72	-
V-36087	B	1/5/72	-
V-36093			-
V-36094	B	1/5/72	-
V-36095			-
V-36096			-
V-36098			-
V-36100	F	8/3/73	H
V-36102	A	1/5/72	H
V-36103			-
V-36104			-
V-36105			-
V-36106			-
V-36107			-
V-36107	A	7/24/72	-
V-36108			-
V-36109			-
V-36110			-
V-36111			-
V-36113	D	1/5/72	H
V-36114		11/26/69	-
V-36115		2/9/70	H
V-36116		6/17/70	-
V-36117		6/17/70	-
V-36118		6/17/70	-
V-36119	A	1/5/72	-
V-36120		6/17/70	-
V-36121		6/17/70	-
V-36122		6/17/70	-
V-36123		6/17/70	-
V-36124		6/17/70	-
V-36125		6/17/70	H
V-36126		9/17/70	-
V-36127		9/17/70	H
V-36128		9/17/70	-
V-36129		9/17/70	-
V-36130		9/17/70	-
V-36131		9/17/70	-
V-36132		9/17/70	H
V-36133		11/5/70	H
V-36134	A	3/25/71	H
V-36136	A	7/24/72	H
V-36137	A	5/23/72	H
V-36138	A	7/24/72	H
V-36139	A	7/24/72	-
V-36141		8/9/71	-
V-36142	A	1/5/72	H
V-36143		1/5/72	-
V-36144		1/5/72	-
V-36145		1/5/72	-
V-36146		1/5/72	-

V-36150		1/5/72	H
V-36152		5/23/72	-
V-36153		5/23/72	-
V-36154		5/23/72	-
V-36155		5/23/72	-
V-36156		5/23/72	-
V-36160		5/23/72	-
V-36161		5/23/72	-
V-36163		7/24/72	-
V-36165		7/24/72	-
V-36167		10/5/72	-
V-36800	A	3/25/71	H
V-36802	A	8/9/71	-
V-36803	A	8/9/71	-
V-36804	A	8/9/71	-
V-36805	A	3/25/71	-
V-36807	A	3/25/71	H
V-36808	A	3/25/71	H
V-36809	B	10/5/72	H
V-36810		3/2/72	-
V-36811	A	3/25/71	-
V-36812	A	3/25/71	H
V-36813	A	3/25/71	H
V-36814	A	3/25/71	H
V-36815	A	3/25/71	H
V-36816	A	3/25/71	H
V-36818	A	3/25/71	H
V-36819	A	8/9/71	-
V-36821	A	3/25/71	H
V-36822		12/10/73	H
V-36823	A	3/2/72	-
V-36826		3/2/72	H
V-36827	A	3/25/71	-
V-36828	A	3/25/71	-
V-36829	A	3/25/71	H
V-36837	A	8/9/71	-
V-36838	A	3/25/71	H
V-36839	A	1/5/72	H
V-36840	A	1/5/72	H
V-36842	A	8/9/71	-
V-36844	A	1/5/72	H
V-36846	A	12/10/73	H
V-36848		3/25/71	-
V-36849	A	3/25/71	-
V-36850	A	3/25/71	-
V-36851	A	3/25/71	H
V-36852	B	3/25/71	H
V-36853	A	3/25/71	H
V-36854	A	3/25/71	-
V-36856	A	3/25/71	-
V-36857	A	3/25/71	-
V-36862	A	3/25/71	H
V-36863	A	3/25/71	H

V-36864	A	3/25/71	H
V-36866	A	1/5/72	H
V-36871	A	3/25/71	-
V-36872	A	8/9/71	H
V-36873	A	3/25/71	-
V-36875	A	3/25/71	-
V-36876	A	3/25/71	H
V-36877	A	1/5/72	-
V-36880		1/1/73	H
V-36883		1/5/72	H
V-36884		3/2/72	H
V-36885		8/3/73	H
V-36887	A	3/25/71	H
V-36888	A	3/25/71	H
V-36891		8/9/71	H
V-36892	A	8/9/71	-
V-36893	A	3/25/71	H
V-36896	B	12/10/73	-
V-36900	A	1/5/72	H
V-36901	A	3/25/71	-
V-36905	A	3/25/71	-
V-36906	A	3/25/71	H
V-36908	A	8/9/71	-
V-36912	A	3/25/71	-
V-36913	A	3/25/71	-
V-36914		6/17/70	H
V-36916		1/1/73	-
V-36922	A	3/25/71	-
V-36923	A	3/25/71	-
V-36924	B	3/25/71	-
V-36925	A	3/25/71	-
V-36926	A	3/25/71	-
V-36927	A	3/25/71	H
V-36928	A	3/25/71	-
V-36930	A	3/25/71	-
V-36931	A	3/25/71	-
V-36932	A	3/25/71	-
V-36933	A	3/25/71	-
V-36934	A	3/25/71	-
V-36935	A	6/1/73	H
V-36936	A	8/3/73	-
V-36937	B	8/3/73	H
V-36939		6/1/73	-
V-36940		6/1/73	-
V-36941		6/1/73	H
V-36942		12/10/73	-
V-36943		12/10/73	H
V-36944		12/10/73	-
V-36945		12/10/73	H
V-36946		6/3/74	-
V-37015		1/5/72	-
V-37027	A		-
V-37038			H

V-38000	A		"
V-38001	B	2/9/70	"
V-38006		1/5/72	H
V-38007		1/5/72	"
V-38008		1/5/72	"
V-38009		1/5/72	"
V-38010	A	10/4/74	"
V-38011		1/5/72	"
V-39000	C	3/25/71	H
V-39001	E	7/24/72	H
V-39002	C	3/25/71	H
V-39003	C	3/25/71	H
V-39004	D	7/24/72	H
V-39005	C	3/25/71	H
V-39007	C	7/24/72	H
V-39008	A	7/24/72	H
V-39009	A	7/24/72	H
V-39010	A	7/24/72	H
V-39011	A	6/1/73	H
V-39012	C	6/1/73	H
V-39013	B	6/1/73	H
V-39014	B	6/1/73	"
V-39015	A	2/9/73	"
V-39016	B	12/10/73	H
V-39017	A	2/9/73	H
V-39018	B	3/16/73	H
V-39019		1/5/72	H
V-39020	A	2/9/73	H
V-39021	B	8/3/73	H
V-39022	B	8/3/73	H
V-39023	A	2/9/73	H
V-39024		3/2/72	H
V-39025		3/2/72	H
V-39026	A	2/9/73	H
V-39027		3/2/72	H
V-39028		3/2/72	H
V-39029		3/2/72	H
V-39030		3/2/72	H
V-39031		5/23/72	H

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1 TEST TITLE
SATURN S-IB RP-1 TANKS PNEUMATIC TEST

2 KSC TEST NUMBER
V-20083

3 EFFECTIVITY
AS REQUIRED

4 TEST OBJECTIVES

THE PURPOSE OF THIS TEST IS TO CONDUCT A PNEUMATIC LEAK TEST ON THE S-IB STAGE RP-1 FUEL TANK FORWARD BULKHEADS.

5 TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST X DOES ☐ DOES NOT CONTAIN HAZARDOUS OPERATIONS.

THIS PROCEDURE IS HAZARDOUS BECAUSE RP-1 FUEL LEVEL WILL BE RAISED TO THE OVERFILL SENSOR (APPROX. 637 INCHES) AND THE S-IB STAGE RP-1 FUEL TANKS WILL BE PRESSURIZED TO 21 PSIG.

AFTER ALL SYSTEMS ARE RECONFIGURED, THE PAD WILL BE CLEARED FOR THE RP-1 LEVEL ADJUST OPERATION (TO OVERFILL SENSOR). A CREW WILL BE CLEARED INTO THE PAD TO CLOSE THE PTCS BENTON VALVES AND DISCONNECT THE RP-1 SENSE LINES. AFTER THE CREW HAS CLEARED THE PAD THE S-IB STAGE RP-1 FUEL TANKS WILL BE PRESSURIZED TO 1 PSIG AND A PRESSURE DROP-OFF TEST WILL BE CONDUCTED FOR 15 MINUTES. IF THE PRESSURE DROP-OFF TEST IS SATISFACTORY, THE TANKS WILL BE PRESSURIZED TO 10 PSIG AND ANOTHER PRESSURE DROP-OFF TEST WILL BE CONDUCTED FOR 15 MINUTES. UPON VERIFICATION OF A STABILIZED CONDITION IN THE S-IB STAGE FUEL TANKS, THE PRESSURE IN THE TANKS WILL BE VENTED TO ZERO PSIG. A CREW WILL THEN BE CLEARED TO THE PAD TO PERFORM A VISUAL INSPECTION AND DYE PENETRATE OPERATION. AFTER THIS CREW HAS CLEARED THE PAD, THE S-IB RP-1 FUEL TANKS WILL BE PRESSURIZED TO 21 PSIG THEN IMMEDIATELY VENTED TO ZERO PSIG. A CREW WILL THEN GO TO THE PAD TO CONDUCT LEAK CHECKS, OPEN THE PTCS BENTON VALVES AND CONNECT THE RP-1 SENSE LINES. AFTER THIS CREW HAS CLEARED THE PAD, A RP-1 LEVEL ADJUST OPERATION WILL BE CONDUCTED (LOWER LEVEL TO 600 INCHES). UPON COMPLETION OF THE LEVEL ADJUSTMENT THE PAD WILL BE OPEN FOR NORMAL WORK.

TEST REQUIREMENTS:

NONE

6 REV	DATE	REASON	Contractor Approval	KSC Approval
A	9/5/74	ASTP UPDATE	G Owens 9/5/74	J Bryan 9/9/74

7 CONTRACTOR APPROVAL	8 ORGANIZATION	9 DATE
G Owens	5-8771	12/4/73
10 NASA/KSC APPROVAL	11 ORGANIZATION	12 APPROVAL DATE
Frank Bryan	LV-ENG	12/4/73

KSC FORM 23-3186 (7-67)

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1 TEST TITLE
SATURN S-IB RP-1 TANKS PNEUMATIC TEST

2 KSC TEST NUMBER
V-20083

3 EFFECTIVITY
AS REQUIRED

13 LOCATION	14 COMPUTER PROG IDENTIFICATION	15 EST. TEST TIME
LC-39, PAD B	OAPU	14 HOURS

16 SUPPORT REQUIREMENTS

KSC SYSTEMS SAFETY	S-IB GROUND POWER
SECURITY POLICE	IWS
FIRE FIGHTING	RP-1 STRIP CHART RECORDERS
MEDICAL	PTCS
LCC MEASUREMENTS	DDAS
FACILITY MEASUREMENTS	DEE-3
RP-1 SURVEILLANCE CAMERAS	ECS
COUNT CLOCK	
S-IB STAGE POWER	

17 OTHER APPLICABLE REFERENCE DOCUMENTATION

N/A

18 ITEM CONTINUATION

NASA FORM 23-186C (7-67)

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
LAUNCH VEHICLE STRAIN MEASUREMENTS IN HIGH WIND

2. KSC TEST NUMBER
V-20084

3. EFFECTIVITY
AS REQUIRED

4. TEST OBJECTIVES
TO OBTAIN LAUNCH VEHICLE STRAIN DATA.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT CONTAIN HAZARDOUS OPERATIONS.

CONFIGURATION: TEST TO BE PERFORMED AT PAD B WITH THE S/V FULLY ASSEMBLED.

LAUNCH VEHICLE STRAIN MEASUREMENTS (S-IB) AND TIME CORRELATED WIND MEASUREMENTS WILL BE RECORDED & MONITORED ANYTIME HIGH WINDS OCCUR WHICH MIGHT JEOPARDIZE THE STRUCTURE OF THE LAUNCH VEHICLE.

ADDITIONAL DATA, WHICH IS DESIRABLE, ARE PRIMARY & AUXILLIARY DAMPER ARM PRESSURES & POSITIONS AND APOLLO ACCESS ARM EXTENSION.

TEST REQUIREMENTS:

B.9.0.1.3.1
B.9.0.1.3.2
B.9.0.1.3.3

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
A	9/5/74	ASTP UPDATE	J.D. Owens 9/5/74	F. Bryan 9/22

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
S/J.D. OWENS	S-8771	2/28/3
10. NASA KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
S/FRANK BRYAN	LV-ENG	MARCH 5 '73

KSC FORM 23-339B (7-67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
LAUNCH VEHICLE STRAIN MEASUREMENTS IN HIGH WIND

2. KSC TEST NUMBER
V-20084

3. EFFECTIVITY
AS REQUIRED

13. LOCATION	14. COMPUTER PROG. IDENTIFICATION	15. EST. TEST TIME
LC 39	N/A	

16. SUPPORT REQUIREMENTS

INTERSTAGE - NONE

ON COMPLEX SUPPORT - OIS COMMUNICATIONS & RADIO

OFF COMPLEX SUPPORT - GSE MEASURING (INS)

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

18. ITEM CONTINUATION

KSC FORM 23-339C (7-67)

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
SATURN S-IB FUEL VENT PNEUMATIC TEST

2. KSC TEST NUMBER
V-20085

3. EFFECTIVITY
AS REQUIRED

4. TEST OBJECTIVES

THE PURPOSE OF THIS TEST IS TO CONDUCT A PNEUMATIC TEST ON THE S-IB STAGE RP-1 FUEL TANK VENT VALVES.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST X *DOES* ___ *DOES NOT CONTAIN HAZARDOUS OPERATIONS.*

THIS PROCEDURE IS HAZARDOUS BECAUSE THE S-IB STAGE RP-1 TANKS WILL BE PRESSURIZED TO 19.5 PSIG. RP-1 TANKS ARE FILLED TO 600 INCH LEVEL.

AFTER S-IB STAGE POWER UP AND ALL SYSTEMS RECONFIGURED, THE S-IB STAGE RP-1 FUEL TANKS WILL BE PRESSURIZED TO 10 PSIG AND A LEAK CHECK CONDUCTED. THE FUEL TANKS WILL THEN BE VENTED TO ZERO PSIG AND THE PAD WILL BE CLEARED. THE S-IB STAGE RP-1 FUEL TANKS WILL THEN BE PRESSURIZED UNTIL EITHER OR BOTH STAGE FUEL VENTS OPEN OR UNTIL 19.5 PSIG IS NOTED ON THE FUEL TANK MONITOR GUAGE. THE FUEL TANKS WILL BE VERIFIED AT ZERO PSIG BEFORE THE PAD IS OPENED.

TEST REQUIREMENTS:

NONE

6. REV	DATE	REASON	Contractor Approval	KSC Approval
A	12/5/74	ASTP UPDATE	JD Queens 9/5/74	F. Bryan 9/12/74

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
J.D. Queens	S-8771	12/4/73
10. NASA-KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
Frank Bryan	LV-ENG	12/4/73

KSC FORM 23-338B (7-67)

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
SATURN S-IB FUEL VENT PNEUMATIC TEST

2. KSC TEST NUMBER
V-20085

3. EFFECTIVITY
AS REQUIRED

13. LOCATION
LC-39, PAD B

14. COMPUTER PROG. IDENTIFICATION
OAPU

15. EST. TEST TIME
7 HOURS

16. SUPPORT REQUIREMENTS

KSC SYSTEMS SAFETY
SECURITY POLICE
FIRE FIGHTING
MEDICAL
LCC MEASUREMENTS
FACILITY MEASUREMENTS
RP-1 SURVEILLANCE CAMERAS
COUNT CLOCK
S-IB STAGE POWER
S-IB GROUND POWER
IWS
RP-1 STRIP CHART RECORDERS
PTCS
DDAS
DEE-3
ECS

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

18. ITEM CONTINUATION

KSC FORM 23-338C (7-67)

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
SATURN IB FIN REPLACEMENT AT PAD B

2. KSC TEST NUMBER
V-20086

3. EFFECTIVITY
AS REQUIRED

4. TEST OBJECTIVES

TO REPLACE FINS ON THE S-IB STAGE WITH THE LAUNCH VEHICLE AT PAD B.

5. TEST DESCRIPTION/EQUIPMENT STATUS CONFIGURATION

THIS TEST X DOES ___ DOES NOT CONTAIN HAZARDOUS OPERATIONS.

THIS PROCEDURE IS HAZARDOUS BECAUSE IT REQUIRES TEST PERSONNEL TO WORK AT HEIGHTS, NEAR HEAVY EQUIPMENT AND UNDER SUSPENDED LOADS.

A 65 TON MOBILE CRANE WILL BE USED TO MOVE REPLACEMENT FINS TO THE MOBILE LAUNCHER ZERO LEVEL AND TO UNBOX THE FINS. THE FINS WILL BE INSPECTED, FLOURESCENT DYE CHECKED AND PREPARED FOR INSTALLATION. SOFT BELLOWS COVERS WILL BE INSTALLED ON LOX AND FUEL SUCTION LINE BELLOWS AND RED FLAGS INSTALLED. CRITICAL DIMENSIONS WILL BE MEASURED PRIOR TO FIN REMOVAL.

FINS WILL BE REMOVED AND REPLACED ONE AT A TIME.

THE HOLDDOWN ARM WILL BE RETRACTED FOR THE FIN BEING REMOVED. HUCK BOLTS WILL BE REMOVED. FIN HANDLING ASSEMBLIES WILL BE ATTACHED. THE HAMMERHEAD CRANE WILL BE USED TO TRANSFER EACH FIN TO THE MOBILE LAUNCHER ZERO LEVEL AND TO HOIST THE REPLACEMENT FIN TO THE LAUNCHER PEDESTAL. SPECIAL HANDLING EQUIPMENT WILL BE USED TO MOVE FINS BETWEEN THE VEHICLE AND THE PEDESTAL. REPLACEMENT FINS WILL BE BOLTED IN PLACE, HOLDDOWN ARMS RELOADED, AND ALIGNMENT ACCOMPLISHED.

TEST REQUIREMENTS:

NONE

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
A	9/22	ALTP UPDATE	J.D. Owens 9/5/74	J.O. Bryan 9/22

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
J.D. Owens	S-8771	12/4/73
10. GSA-KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
Frank Bryan	LV-ENG	12/4/73

KSC FORM 23-338C (7-67)

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
SATURN IB FIN REPLACEMENT AT PAD B

2. KSC TEST NUMBER
V-20086

3. EFFECTIVITY
AS REQUIRED

13. LOCATION
LC-39B

14. COMPUTER PROG. IDENTIFICATION
N/A

15. EST. TEST TIME
3 DAYS

16. SUPPORT REQUIREMENTS

HEAVY EQUIPMENT PERSONNEL
KSC SYSTEM SAFETY
SECURITY POLICE
CRANE CREWS
OTV (OPTIONAL)

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

N/A

18. ITEM CONTINUATION

KSC FORM 23-338C (7-67)

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
SATURN IB LAUNCH VEHICLE T-20 MINUTE SIMULATION TEST

2. KSC TEST NUMBER
V-20100

3. EFFECTIVITY
AS-206 AND SUBS

4. TEST OBJECTIVES

TO MAINTAIN LV FIRING ROOM CREW PROFICIENCY DURING EXTENDED VEHICLE PROCESSING FLOW.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST ___ DOES X DOES NOT CONTAIN HAZARDOUS OPERATIONS.

THIS TEST WILL PROVIDE LWR PROFICIENCY TRAINING OF THE LAUNCH VEHICLE FIRING ROOM CREW, INCLUDING THE REDLINE MONITORS, THROUGH THE USE OF DDAS TAPES SIMULATING LAUNCH VEHICLE AND ASSOCIATED ESE FUNCTIONS OCCURRING DURING THE FINAL 20 MINUTES OF THE SATURN IB LAUNCH VEHICLE COUNTDOWN.

THE TEST WILL BE RUN WITH DDAS TAPES SIMULATING VEHICLE AND ESE FUNCTIONS. TCE AND A DATA MODIFICATION UNIT (DMU) IS AVAILABLE TO INTRODUCE MALFUNCTIONS AGAINST A BASELINE TAPE.

THE TEST WILL ENABLE THE FIRING ROOM CREW TO SIMULATE A NORMAL LAUNCH CD FROM T-20 MINUTES TO T-0, AND TO REACT TO SIMULATED MALFUNCTIONS TO DETERMINE THE OPERATORS ABILITIES TO COPE WITH MALFUNCTIONS AND EITHER CONTINUE THE TEST OR PROCEED WITH VEHICLE SAFING AND RECYCLE.

THE LAUNCH VEHICLE, AND 110A COMPUTERS ARE NOT REQUIRED.

HARDWARE INDICATIONS WILL NOT BE DISPLAYED. DIGITAL ACQUISITION SYSTEM WILL NOT BE USED FOR THE TEST. BACKUP FIRING ROOM SUPPORT IS NOT REQUIRED.

TEST REQUIREMENTS:

NONE

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
B	9/5/74	ASTP UPDATE	9/5/74	9/22
A		REVISE DESCRIPTION, ADD DMU CAPABILITY, CHANGE T-15 TO T-20 MINUTES	3/19/73	3/19

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
S/U. D. OWENS	S-8771	SEPTEMBER 10, 1971
10. NASA-KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
S/FRANK BRYAN	LV-ENG	FEBRUARY 14, 1972

KSC FORM 23-339B (7/67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
SATURN IB LAUNCH VEHICLE T-20 MINUTES SIMULATION TEST

2. KSC TEST NUMBER
V-20100

3. EFFECTIVITY
AS-206 AND SUBS

13. LOCATION	14. COMPUTER PROG. IDENTIFICATION	15. EST. TEST TIME
LC-39	N/A	4 HOURS

16. SUPPORT REQUIREMENTS

DDAS
DDAS TAPE RECORDING
COUNT CLOCK
COUNT CLOCK DISPLAYS
COUNT CLOCK SUPERIMPOSED ON TV MONITOR
TV MONITOR
OIS (RF & AUDIO)
OIS RECORDING
LV STAFF LOOP
LV BACKUP PHONE LOOP (YELLOW PHONE)
LCC POWER SUPPLIES
LCC STRIP CHART RECORDERS NOT MONITORING
HARD WIRE FUNCTIONS
TELEMETRY CHECKOUT EQUIPMENT (TCE)
DATA MODIFICATION UNIT (DMU)

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

18. ITEM CONTINUATION

KSC FORM 23-339C (7/67)

51

REV 32

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 3

1. TEST TITLE
SATURN IB LAUNCH VEHICLE ELECTRICAL SYSTEMS TEST

2. KSC TEST NUMBER
V-20101

3. EFFECTIVITY
AS-206 AND SUBS

4. TEST OBJECTIVES
1. TO ELECTRICALLY MATE THE LAUNCH VEHICLE STAGE INTERFACES AFTER THE LAUNCH VEHICLE HAS BEEN MECHANICALLY MATED.
2. TO VERIFY PROPER OPERATION OF THE LAUNCH VEHICLE SWITCH SELECTORS AND ASSOCIATED GSE.
3. TO VERIFY THAT ALL LAUNCH VEHICLE STAGES CAN SUCCESSFULLY TRANSFER TO INTERNAL POWER BOTH VIA TERMINAL COUNTDOWN SEQUENCER (TCS) AND MANUALLY.
4. TO VERIFY PROPER OPERATION OF EMERGENCY DETECTION SYSTEM (EDS).

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT CONTAIN HAZARDOUS OPERATIONS.

A. LAUNCH VEHICLE ELECTRICAL INTERFACE MATE - THE S-IB, S-IVB AND IU WILL BE MECHANICALLY MATED ON ML IN HIGH BAY OF THE VAB.

IN PART I (RESISTANCE MEASUREMENTS), THE LAUNCH VEHICLE STAGES WILL BE ELECTRICALLY ISOLATED AND RESISTANCE MEASUREMENTS WILL BE MADE AT EACH PIN OF THE STAGE INTERFACE CONNECTORS TO THE VEHICLE SKIN. RESISTANCE MEASUREMENTS WILL NOT BE MADE AT FLIGHT CONTROL CABLES. FLIGHT CONTROL CABLES WILL BE MATED THROUGH INTERSTAGE SEPARATION SIMULATORS WITHOUT BREAKOUT BOXES AT THE S-IB/S-IVB INTERFACE, AND MATED DIRECTLY AT THE S-IVB/IU INTERFACE.

IN PART II (VOLTAGE CHECKS), FUSES WILL BE INSTALLED IN BREAKOUT BOXES TO WHICH THE INTERSTAGE CABLES ARE CONNECTED. VEHICLE POWER WILL THEN BE APPLIED AND VOLTAGE MEASUREMENTS WILL BE MADE AT SELECTED POINTS AT THE BREAKOUT BOXES.

THE LAUNCH VEHICLE WILL BE ERECTED ON THE ML IN THE VAB AND ALL STAGES WILL BE MECHANICALLY AND ELECTRICALLY MATED FOR ALL REMAINING PARTS OF THIS TEST.

B. LAUNCH VEHICLE SWITCH SELECTOR TEST - A MANUAL INTERFACE TEST WILL BE RUN TO VERIFY THE INTERFACE BETWEEN THE IU SWITCH SELECTOR PANEL AND THE LAUNCH VEHICLE SWITCH SELECTORS. THIS TEST WILL VERIFY THE STAGE SELECT SIGNALS AND "ALL ONE'S".

AN AUTOMATED TEST WILL BE PERFORMED TO VERIFY THE INTERFACE BETWEEN THE GROUND COMPUTER AND THE SWITCH SELECTORS USING "FLOATING ONE'S" AND "ALL ONE'S".

A SECOND AUTOMATED TEST WILL BE PERFORMED IN WHICH EACH SWITCH SELECTOR WILL BE INDIVIDUALLY SELECTED AND ALL OUTPUTS COMMANDED TO READ. MALFUNCTIONS WILL BE INTRODUCED TO TEST FOR PROPER RESPONSE IN THE ESE.

CONTINUED ON PAGE 3

REV	DATE	REASON	Contractor Approval	KSC Approval
				J. Bryan 9/22
B	9/15/72	ADD RD DOC NO. & AUTO PROG.	J. Owens 9/15/72	Frank Bryan 9/14/72
A	8/10/72	ADD MSFC REQMTS & COMP. PROC IDENTIFICATIONS	J. Owens 9/6/72	Frank Bryan

6. CONTRACTOR APPROVAL: J. Owens
7. ORGANIZATION: S-ESTL
8. DATE: August 26, 1971
9. NASA-KSC APPROVAL: Frank Bryan
10. ORGANIZATION: LV-ENG
11. APPROVAL DATE: 3/14/72

KSC FORM 29 336B (7/67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 3

1. TEST TITLE
SATURN IB LAUNCH VEHICLE ELECTRICAL SYSTEMS TEST

2. KSC TEST NUMBER
V-20101

3. EFFECTIVITY
AS-206 AND SUBS

12. LOCATION
VAB

14. COMPUTER PROG. IDENTIFICATION
(SEE ITEM 18)

15. EST. TEST TIME
9 HOURS

16. SUPPORT REQUIREMENTS
RD 26008
GROUND POWER
S-IB STAGE POWER
S-IVB STAGE POWER
IU POWER
RCA 110A COMPUTERS
FACILITY ECS (GAS)
LV ECS (GAS)
DDAS
DDAS TAPE RECORDING
BACK-UP BATTERIES
LCC MEASURING (LVO)
OAT EQUIPMENT
DEE-6

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

18. ITEM CONTINUATION
(5) TEST DESCRIPTION (CONTINUED)

C. LAUNCH VEHICLE POWER TRANSFER TEST - THE TEST WILL BE RUN IN TWO PARTS, THE FIRST PART USING PLUGS-IN CONFIGURATION AND THE SECOND PART USING PLUGS-OUT CONFIGURATION.

IN PART I, PLUGS-IN CONFIGURATION, THE LAUNCH VEHICLE STAGES WILL BE TRANSFERRED TO INTERNAL POWER BY USING AN AUTOMATIC PROGRAM. AFTER VERIFICATION OF NORMAL OPERATION, ALL STAGES WILL BE TRANSFERRED BACK TO EXTERNAL POWER USING EMERGENCY POWER TRANSFER.

IN PART II, PLUGS-OUT CONFIGURATION, THE LAUNCH VEHICLE WILL BE TRANSFERRED TO INTERNAL POWER, SIMULTANEOUSLY BY MANUAL CONTROL. THE STAGES WILL VERIFY NORMAL OPERATION AND TRANSFER BACK TO EXTERNAL POWER INDIVIDUALLY. THE LAUNCH VEHICLE WILL THEN BE TRANSFERRED SIMULTANEOUSLY TO INTERNAL POWER VIA THE TCS. AFTER VERIFICATION OF NORMAL OPERATION, ALL STAGES WILL BE TRANSFERRED BACK TO EXTERNAL POWER UTILIZING S-IB CUTOFF. FINALLY A POWER TRANSFER TO INTERNAL POWER AND BACK TO EXTERNAL POWER BY AN AUTOMATIC PROGRAM WILL BE EXECUTED.

D. EMERGENCY DETECTION SYSTEM (EDS) TEST - THIS TEST WILL CHECKOUT THE EMERGENCY DETECTION SYSTEM WITHIN THE LAUNCH VEHICLE WITH THE EXCEPTION OF THE Q-BALL AND RF ABORT REQUEST CIRCUITRY.

E. PULSE STRETCHER CALIBRATION TEST - THE CALIBRATION OF THE PULSE STRETCHER CIRCUITS WILL BE PERFORMED TO INSURE THAT THE RANGE SAFETY COMMAND RECEIVERS OF THE S-IB, AND S-IVB WILL ACCEPT THE FOLLOWING COMMANDS: ARM AND ENGINE CUTOFF, PROPELLANT DISPERSION, AND THE SAFING COMMAND FOR THE S-IVB ONLY.

F. REDUNDANT POWER SUPPLY TEST - THE ADEQUACY OF THE REDUNDANT POWER SUPPLIES WILL BE VERIFIED IN THIS TEST.

KSC FORM 29 336C (7/67)

APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET (CONTINUATION SHEET)	PAGE 3 OF 3
1. TEST TITLE SATURN IB LAUNCH VEHICLE ELECTRICAL SYSTEMS TEST	2. MSC TEST NUMBER V-20101
	3. EFFECTIVITY AS-206 AND SUBS

ITEM CONTINUATION

14. COMPUTER PROC. IDENTIFICATION (CONTINUED)

IAED	IASS	IZRE	CAPU	EAPS
IAFU	IZEA	IZSA	MT98	
IAPX	IZEC	LA01	MT99	

5. TEST DESCRIPTION (CONTINUED)

TEST REQUIREMENTS

(LV)	TM-011-001-2H	B.1.4.1.1, B.1.6.1.1.1, B.1.6.1.2.1, B.7.0.1, B.7.0.2
(IU)	7921601	0.3.4.2.1.1, 0.3.4.2.3.2, 0.3.4.3.1 THRU 0.3.4.3.2.1,
(S-IB)	60C06050	3.5.1.1.3.1, 3.5.1.1.3.2, 3.5.1.1.4.1, 3.5.1.1.4.2 3.5.1.1.4.3, 3.5.3.2 (ALL)
(S-IVB)	1B36721	0.2.5.2.2.1, 0.2.5.2.2.2, 0.2.5.2.2.3, 0.2.5.2.2.4

D	7/5/74	ASTP UPDATE	J Davies 4/5/74	
C	2/1/73	UPDATE MSFC REQUIREMENTS	s/J.D.OWENS 2/2/73	s/FRANK BRYAN 2/4/73

MSC FORM 22-1980 (7-67)

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE: SATURN IB PULL TEST

2. KSC TEST NUMBER: V-20102

3. EFFECTIVITY: AS-206 AND SUBS

4. TEST OBJECTIVES

TO VERIFY SV/PEDESTAL LATERAL STIFFNESS CONSTANTS AND DETERMINE THE NATURAL FREQUENCY OF THE FIRST BENDING MODE.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST ☒ DOES ☐ DOES NOT CONTAIN HAZARDOUS OPERATIONS.

HAZARDOUS OPERATIONS:
(A) WORK AT HEIGHT
(B) CABLE UNDER TENSION

THE TEST WILL BE PERFORMED IN THE VAB WITH THE S/V FULLY ASSEMBLED USING THE BP-30 CSM WITH STUB TOWER. HOLDDOWN ARMS WILL BE PRELOADED. ALL ACCESS DOORS WILL BE SECURED. ACCESS KITS MAY BE LEFT INSTALLED IN THE INTERSTAGES. S-IVB TUNNEL COVERS WILL NOT BE INSTALLED.

THE STIFFNESS TEST WILL BE PERFORMED IN EACH OF TWO DIRECTIONS DIFFERING BY AN ANGLE OF 9083 DEGREES, A WEST PULL AND A NORTH PULL. THE TEST WILL APPLY A TRANSVERSE PULL FORCE ON THE VEHICLE AT THE BP-30 STUB TOWER. THE PULL FORCE APPLIED SHALL BE INCREMENTALLY INCREASED FROM 0 TO A MAXIMUM, AND THEN DECREASED TO 0 AT THE SAME INCREMENTAL RATE FOR TWO COMPLETE CYCLES IN EACH DIRECTION.

VEHICLE DEFLECTION WILL BE MEASURED BY ELECTRO-MECHANICAL AND/OR OPTICAL METHODS. OPTICAL DEFLECTION MEASUREMENTS WILL BE CONSIDERED VALID OVER MECHANICAL MEASUREMENTS. THE PULL FORCE WILL BE SUPPLIED BY A HYDRAULIC CYLINDER WITH A CABLE TRANSMITTING THE PULL FORCE TO THE VEHICLE.

THE DYNAMIC TEST SHALL BE PERFORMED BY MANUALLY PUSHING THE VEHICLE IN THE PITCH PLANE TO A DEFLECTION AMPLITUDE OF 5 INCHES TO DETERMINE THE NATURAL FREQUENCY OF THE FIRST BENDING MODE OF THE VEHICLE/PEDESTAL COMBINATION. PHOTOGRAPHIC RECORDING WILL BE MADE OF THE AMPLITUDE AND FREQUENCY. THE DYNAMIC TEST WILL BE REPEATED 2 TIMES. DEFLECTION AMPLITUDE SHALL BE MEASURED AT VEHICLE STATION 2037.5.

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
B	9/15/74	ASTP UPDATE	F. Owens 9/5/74	9/22
A	7/28/72	ADD DYNAMIC TEST, CHG HAZ OPER, ADD TEST REQMTS	7/28/72	8-4-72

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
S/J. D. OWENS	S-8771	AUGUST 25, 1971
10. NASA-KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
S/J. T. HUMPHREY	LV-MEC-2	9/17/71
S/FRANK BRYAN	LV-ENG	9/23/71

KSC FORM 23-136B (7-67)

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE: SATURN IB PULL TEST

2. KSC TEST NUMBER: V-20102

3. EFFECTIVITY: AS-206 AND SUBS

12. LOCATION: VAB

13. COMPUTER PROG. IDENTIFICATION:

14. EST. TEST TIME: 1 DAY

15. SUPPORT REQUIREMENTS

RD26005	L/V ECS (GAS)
GROUND POWER	CIF TM RECORDING
S-IB STAGE POWER	TM RECORDS
COUNTDOWN CLOCK	DEE-6
GSE MEASURING (INS)	KSC PAD SAFETY
DDAS	FIRE FIGHTING
DDAS TAPE RECORDING	MEDICAL
RCA 110A COMPUTERS	PLATFORM OPERATIONS
FACILITY ECS (GAS)	TIMING
FACILITY COMM. (OIS)	FILM CAMERAS
VMGSE	OVERHEAD CRANE

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

18. ITEM CONTINUATION

5. TEST DESCRIPTION (CONTINUED)

TEST REQUIREMENTS:

LV	TM-011-001-2H	(NONE)
IU	7921601	0.3.3.0(ONLY)
S-IB	60C06050	(NONE)
S-IVB	1B86721	(NONE)

KSC FORM 23-33AC (7/67)

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE: SATURN IB LAUNCH VEHICLE MALFUNCTION OVERALL TEST

2. KSC TEST NUMBER: V-20103

3. EFFECTIVITY: AS-209 AND SUBS

4. TEST OBJECTIVES

TO VERIFY PROPER STAGE AND GSE RESPONSE TO MALFUNCTIONS INDUCED DURING THE AUTOMATIC FIRING SEQUENCE. TO VERIFY PROPER OPERATION OF THE ELECTRICAL/MECHANICAL VEHICLE AND GSE SYSTEMS DURING A NORMAL AUTOMATIC FIRING SEQUENCE AND FLIGHT SEQUENCE. TO PERFORM PLUS TIME TEST WITH VARIOUS COMMANDS BEING INITIATED VIA THE SPACECRAFT TO VERIFY PROPER OPERATION OF THE LV RANGE SAFETY COMMAND SYSTEM.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST [X] DOES [ ] DOES NOT CONTAIN HAZARDOUS OPERATIONS.

HAZARDOUS OPERATIONS:

A. HYDRAULIC SYSTEM PRESSURES ARE APPLIED WHILE SERVO ACTUATOR MECHANICAL LOCKS ARE REMOVED (S-IVB ENGINE MAY GIMBAL).
B. HAZARDOUS SUBTASKS ARE PERFORMED DURING THE TEST.
C. S-IVB ENGINE WILL GIMBAL DURING PLUS TIME (PART 9).
D. HOLDDOWN ARMS WILL RELEASE

THE LAUNCH VEHICLE WILL BE ERECTED ON THE ML, AND ALL STAGES MECHANICALLY AND ELECTRICALLY MATED.

THE TEST WILL BE DIVIDED INTO NINE PARTS. THESE PARTS MAY BE IDENTIFIED AS FOLLOWS:

PART 1: TCS POWER SUPPLY FAILURE, PREMATURE COMMIT & MANUAL CUTOFF.
PART 2: PREPARATIONS COMPLETE & LAUNCH SEQUENCE START FAILURE.
PART 3: S-IB VOLTAGE FAILURE CUTOFF.
PART 4: SEQUENCE FAILURE CUTOFF.
PART 5: POST IGNITION CUTOFFS
PART 6: THRUST FAILURE CUTOFF
PART 7: ANY ENGINE CUTOFF AFTER COMMIT
PART 8: PROPELLANT SIM LOAD, CHILLDOWN PERTURBATIONS, LAUNCH FAILURE CUTOFF
PART 9: SIMULATED FLIGHT TEST

THE NINE PARTS CONSIST OF VARIOUS SIMULATED MALFUNCTIONS TO VERIFY PROPER OPERATION OF THE LAUNCH VEHICLE AND GROUND SUPPORT EQUIPMENT DURING ABBREVIATED COUNTDOWN, LIFTOFF AND (DURING PART 9 ONLY) FLIGHT SEQUENCE. PART 8 WILL INCLUDE A SIMULATED VEHICLE PROPELLANT LOAD & DRAIN. PART 9 WILL INCLUDE THE COMPLETE IALL & IATS GROUND COMPUTER PROGRAMS.

CONTINUED ON PAGE 2

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
F	6/29/73	ADDED NEW PART 7	J.D. Owens 8/31/73	F. Bryan 9/2
E	3/22/73	DELETED PART 7, ADDED PART 8	J.D. Owens 4/11/73	F. Bryan 4/16/73
D	2/12/73	GENERAL REVISION	2/13 S/J.D. OWENS	2/15 S/F. BRYAN
C	11/28/72	ADD LV TEST REQUIREMENTS	11/28 S/J.D. OWENS	11/29 S/F. BRYAN
B	10/19/72	TEST REQMTS, LOCATION, HAZARDOUS OPS	10/19 S/J.D. OWENS	10/19 S/F. BRYAN

7. CONTRACTOR APPROVAL: S/J. D. OWENS
8. ORGANIZATION: S-8771, BATC
9. DATE: FEB. 2, 1972

10. NASA PSC APPROVAL: S/FRANK BRYAN
11. ORGANIZATION: LV-ENG
12. APPROVAL DATE: FEB. 14, 1972

KSC FORM 23 336B (7 67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE: SATURN IB LAUNCH VEHICLE MALFUNCTION OVERALL TEST

2. KSC TEST NUMBER: V-20103

3. EFFECTIVITY: AS-209 AND SUBS

13. LOCATION: PAD

14. COMPUTER PROG. IDENTIFICATION: SEE ITEM 18

15. EST. TEST TIME: THREE DAYS

16. SUPPORT REQUIREMENTS

GROUND SUPPORT	SD 26004	FACILITY COMMUNICATIONS (OIS)
S-IB STAGE POWER	LCC DATA DISPLAY	LV ECS
S-IVB STAGE POWER	CIF DATA DISPLAY	LCC TM STATION (MONITORS)
IU POWER	DDAS	LCC TM RECORDING
BACKUP BATTERIES	DDAS TAPE RECORDING	CIF TM RECORDING
TIMING	DEE-6	CIF COMPUTER
COUNTDOWN CLOCK	110A COMPUTERS	CIF DATA
LCC MEASURING (INS)	LV W-G ECS	TM RECORDER
LCC MEASURING (LVO)	FACILITY ECS	REAL-TIME CIF COMPUTER
GSE MEASURING (INS)	H.P. GAS	POST TEST CIF COMPUTER
RD 26004	CCF	

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

18. ITEM CONTINUATION

14. COMPUTER PROGRAMS (CONTINUED)

CE10	FT04	FT37	IAAR	IATC	LA01
	FT05	FT42	IAEC	IATS	LZTJ
EAIC	FT06	FT43	IAFC	IZEA	MT01
EAPF	FT10	FT45	IAHD	IZEC	MT98
EAPS	FT20	FT47	IALL	IZRE	MT99
EASS	FT23	FT49	IAMC	IZSA	OAPU
FE50	FT27	FT55	IAPX	IZ33	OATI
FT81	FT31	GE01	IARS	LAF2	
FT03	FT33	GT16	IASP	LAPW	

5. TEST DESCRIPTION (CONTINUED)

TEST REQUIREMENTS

(S-IB) 60CD6050 3.2.5.3.6, 3.5.3.1.1, 3.5.3.1.2.1 THRU 3.5.3.1.2.9, 3.5.3.1.3, 3.5.3.1.4, 3.5.4.3, 3.7.2.7

(IU) 7921601 0.3.5.2.2.3.2, 0.3.5.2.2.3.1

(LV) TM-011-001-2H 1.1.1.4.1, 1.5.1 THRU 1.5.2, 1.8.1, 2.0.1.1, 2.0.1.4, 7.0.1, 7.0.2

H	7/5/74	ASTP UPDATE	J.D. Owens 7/5/74
G	12/3/73	AMEND TEST REQUIREMENTS	12/3/73 S/L.R. COMMODORE F. BRYAN 12/3/73

KSC FORM 23 336C (7 67)

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
SATURN IB PROPELLANT NETWORKS/VEHICLE INTERFACE VERIFICATION

2. KSC TEST NUMBER
V-20104

3. EFFECTIVITY
AS-206 AND SUBS

4. TEST OBJECTIVES
TO VERIFY END-TO-END PROPELLANT NETWORKS/VEHICLE INTERFACE SIGNALS.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST ___ DOES (X) DOES NOT CONTAIN HAZARDOUS OPERATIONS.

SIGNALS ORIGINATING IN THE VEHICLE OR IN THE ESE ARE INITIATED AT THE SIGNAL SOURCE OR SIMULATED AS CLOSE TO THE SIGNAL SOURCE AS POSSIBLE. RECEIPT OF SIGNALS IS CONFIRMED AT PROPELLANTS PTCR NETWORKS SIMULATORS LOCATED ON LUT ZERO LEVEL.

SIGNALS ORIGINATING IN PROPELLANTS NETWORKS LOGIC ARE SIMULATED AT THE PTCR NETWORKS SIMULATOR OR FIRING ROOM CONTROL PANELS. RECEIPT OF THESE SIGNALS IS CONFIRMED AT ESE CONTROL PANELS.

ALL CIRCUITS CROSSING THE ML & LCC PROPELLANT ESE/VEHICLE INTERFACES ARE TO BE VERIFIED FOR THE S-IB AND S-IVB STAGES FOR RP-1, LOX, AND LH2 SYSTEMS.

THE LAUNCH VEHICLE WILL BE LOCATED IN THE VEHICLE ASSEMBLY BUILDING IN A MATED CONFIGURATION.

TEST REQUIREMENTS

NONE

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
C	2/5/74	ASTP UPDATE	J D Owens 2/5/74	F. F. Byan 2/22
B	12/15/73	ADD PD NUMBER	J D Owens 2/5/73	Frank Byan 2/20
A	4/18/72	UPDATE TEST DESCRIPTION	J R Forbes 4/19/72	Frank Byan 5/3/72

7. CONTRACTOR APPROVAL: J D Owens (Comp)
8. ORGANIZATION: S-8571
9. DATE: Sept. 2, 1971

10. NASA KSC APPROVAL: Frank Byan
11. ORGANIZATION: LV-ENG
12. APPROVAL DATE: 3/14/72

KSC FORM 23-3208 (7/67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

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1. TEST TITLE
SATURN IB PROPELLANT NETWORKS/VEHICLE INTERFACE VERIFICATION

2. KSC TEST NUMBER
V-20104

3. EFFECTIVITY
AS-206 AND SUBS

13. LOCATION: VAB
14. COMPUTER PROG. IDENTIFICATION: N/A
15. EST. TEST TIME: 8 HOURS

16. SUPPORT REQUIREMENTS

SID-20104-B
RCA 110A COMPUTER
LV POWER UP
LSE POWER UP
DEE-6
NETWORKS PTCR SIMULATOR
PTCS-PTCR SIMULATOR

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

18. ITEM CONTINUATION

KSC FORM 23-3208C (7/67)

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KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE

SATURN IB LSE ELECTROMECHANICAL SYSTEMS TEST

2. KSC TEST NUMBER
V-20105

3. EFFECTIVITY
AS-206 AND SUBS

4. TEST OBJECTIVES

TO VERIFY PROPER OPERATION AND ISOLATION OF THE REDUNDANT LSE RETRACTION SYSTEMS.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST __ DOES X DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

THE LAUNCH VEHICLE WILL BE ERECTED ON THE MOBILE LAUNCHER WITH ALL UMBILICAL CARRIER PLATES ATTACHED. SERVICE ARMS, SHORT CABLE MASTS AND S-IB PROPELLANT MASTS WILL BE IN A SAFED CONDITION TO PREVENT POSSIBLE UMBILICAL EJECTION OR RETRACTION. THE TEST WILL BE CONDUCTED BOTH IN THE VAB AND AT THE PAD WITH ALL PARTS BEING PERFORMED IN THE VAB AND AT THE PAD. SERVICE ARM CONTROL SWITCHES ON FINS 3 AND 7 WILL BE OPERATED IN PARTS I - V TO PROVIDE END-TO-END VERIFICATION OF THE TWO REDUNDANT LSE RETRACTION SYSTEMS.

TEST REQUIREMENTS

NONE

6. REV	DATE	REASON	Contractor Approval	KSC Approval
C	9/5/74	ASTP UPDATE	J D Owens 9/5/74	9/22
B	2/15/73	ADD PD NUMBER	J D Owens 2/15/73	2/20
A	10/12/72	DELETE TCS TEST. REDUCE FROM 8 TO 5 PARTS. PERFORM ALL PARTS IN VAB & AT PAD.	J D Owens 10/16/72	10/24

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
S/J. D. OWENS	5-8571	SEPT 24, 1971
10. NASA-KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
S/FRANK BRYAN	LV-ENG	SEPT 27, 1971

KSC FORM 23-328B (7-67)

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE

SATURN IB LSE ELECTROMECHANICAL SYSTEMS TEST

2. KSC TEST NUMBER
V-20105

3. EFFECTIVITY
AS-206 AND SUBS

13. LOCATION	14. COMPUTER PROG. IDENTIFICATION	15. EST. TEST TIME
VAB & PAD B		

16. SUPPORT REQUIREMENTS

RD 28100
LSE BACK-UP BATTERIES
SERVICE ARM FIRING POWER SYSTEM
DDAS
RCA 110A COMPUTERS
HP GAS
FACILITY COMM. (OIS)
DEE-6
S-IB ESE POWER
LSE POWER

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

18. ITEM CONTINUATION

KSC FORM 23-328C (7-67)

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE: SATURN IB SERVICE ARM OVERALL TEST

2. KSC TEST NUMBER: V-20106

3. EFFECTIVITY: AS-207 AND SUBS

4. TEST OBJECTIVES

TO VERIFY COMPATIBILITY AND PROPER OPERATION OF ALL LAUNCH VEHICLE AND GSE SYSTEMS DURING A NORMAL AUTOMATIC FIRING SEQUENCE AND FLIGHT SEQUENCE WITH UMBILICAL EJECTION AND SERVICE ARM AND SHORT CABLE MAST RETRACTION.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST ☒ DOES ☐ DOES NOT CONTAIN HAZARDOUS OPERATIONS.

HAZARDOUS OPERATIONS:

A. UMBILICALS EJECTED.
B. SERVICE ARMS AND SCM'S RETRACTED.

THE LAUNCH VEHICLE WILL BE ERECTED ON THE MOBILE LAUNCHER IN THE VAB. ALL STAGES WILL BE MECHANICALLY AND ELECTRICALLY MATED. THE LAUNCH VEHICLE WILL BE PREPARED AND FUNCTIONALLY CHECKED IN AN ABBEVIATED COUNTDOWN DURING WHICH THE TM, RF, RSCR, G&C, POWER AND EDS SYSTEMS WILL BE VERIFIED. A PROPELLANT DISPERSION TEST WILL BE RUN. THE COUNT WILL PROCEED NORMALLY THROUGH "PREPARATIONS COMPLETE" AND INITIATION OF THE FIRING COMMAND. THE TERMINAL COUNT SEQUENCE WILL PROCEED THROUGH COMMIT. LIFTOFF WILL BE SIMULATED BY SERVICE ARM CONTROL SWITCH OPERATION TO COMMAND UMBILICAL EJECTION AND INFLIGHT SERVICE ARM RETRACTION. LV ECS WILL BE TERMINATED AT UMBILICAL DISCONNECT. SA #9 WILL NOT BE RETRACTED. EXCEPT FOR PLUGS OUT OAT CONFIGURATION, THE LAUNCH VEHICLE WILL BE ELECTRICALLY AND MECHANICALLY SEPARATED FROM THE GSE AFTER LIFTOFF TO SIMULATE FLIGHT CONDITIONS AS CLOSELY AS POSSIBLE. THE FLIGHT COMPUTER WILL PROGRAM THE LAUNCH VEHICLE THROUGH AN ABBREVIATED FLIGHT SEQUENCE THROUGH TIME BASE 5. THE TEST WILL BE TERMINATED AFTER RANGE SAFETY COMMAND FUNCTIONS HAVE BEEN GIVEN TO THE POWERED STAGES.

REV	DATE	REASON	Contractor Approval	KSC Approval
F	3/5/74	ASTP UPDATE	J.D. Owens 4/5/74	[illegible]
E	12/3/73	UPDATE MSFC REQUIREMENTS	[illegible]	[illegible]
D	3/8/73	PROPELLANT DISPERSION TEST ADDED	J.D. Owens 4/3/3	[illegible]
C	1/2/73	DELETE GUIDANCE, TIME BASE 5 WAS 4, CHANGE EFFECTIVITY	S/ 1/3/3 J.D. OWENS	1/5/3 S/BRYAN
B	10/27/2	REVISE HAZ, ADD REQMTS & COMP PROG	S/ 10/27/2 J.D. OWENS	11/1/2 S/BRYAN
A	5/18/72	ADD PROGRAM AND SUPPORT REQUIREMENTS	S/ 5/19/2 L.R. CORBRIDGE	S/ 6/15/2 F. BRYAN

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
S/J. D. OWENS	5-8771	FEB. 2, 1972
10. NASA-KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
S/FRANK BRYAN	LV-ENG	FEB. 9, 1972

KSC FORM 23-338B (7/67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2) PAGE 2

1. TEST TITLE: SATURN IB SERVICE ARM OVERALL TEST

2. KSC TEST NUMBER: V-20106

3. EFFECTIVITY: AS-207 AND SUBS

13. LOCATION: VAB (SEE ITEM 18)

15. TEST DURATION: 8 HOURS

16. SUPPORT REQUIREMENTS

GROUND POWER	DDAS TAPE RECORDING
S-IB STAGE POWER	RCA 110A COMPUTERS
S-IVB STAGE POWER	LV W-G ECS
IU POWER	LV ECS (GAS)
BACKUP BATTERIES	LOCAL COMMAND CARRIER
COUNTDOWN CLOCK	(DRSCS SYSTEM & IU)
OAT EQUIPMENT	LCC TM RECORDING
LSE POWER	LCC TM STATION MONITOR
LCC MEASURING (LVO)	IU RF STATION
GSE MEASURING (LVO)	CIF REAL TIME SUPPORT
DDAS	RD 25004

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

18. ITEM CONTINUATION

5. TEST DESCRIPTION (CONTINUED)

TEST REQUIREMENTS:

LV	TM-011-001-2H	1.1.1.4, 1.1.1.4.1, 1.5.1 THRU 1.5.2, 1.8.1, 1.9.1.1, 2.0.1.1, 2.0.1.6, 5.0.1(ALL), 7.0.1, 7.0.2
S-IB	60C06050	3.7.1.1.1, 3.7.1.1.2.1, 3.7.1.1.2.2, 3.7.1.1.2.3, 3.7.1.1.2.4, 3.7.1.1.2.5, 3.7.1.1.3, 3.7.1.1.4
S-IVB	1B86721	NONE
IU	7921601	0.3.3.2.3, 0.3.4.2.1 THRU 0.3.4.2.5, 0.3.5.2.2.3.2, 0.3.5.2.2.3.1, 0.3.4.2.0.1

14. COMPUTER PROC. IDENTIFICATION (CONTINUED)

CE10	FTB1	FT47	IAAR	IARS	IZRE	LZTU
EA1C	FT04	FT49	IAED	IASL	IZSA	NT98
EAPF	FT06	FT55	IAFC	IASP	IZ33	NT99
EAPS	FT08	FU01	IALL	IATC	LAPW	OAT1
EASS	FT10	GE01	IAMC	IATS	LAF2	OAPU
FE50	FT20	GT16	IAPX	IZEA	LA01	ZT96

KSC FORM 23-338C (7/67)

REV 32

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
SATURN IB LOX & RP-1 DELTA P SENSE LINES QUALIFICATION TEST

2. KSC TEST NUMBER
V-20107

3. EFFECTIVITY
AS-206 AND SUBS

4. TEST OBJECTIVES

TO VERIFY SATISFACTORY OPERATION AND LEAK TIGHTNESS OF THE S-IB DELTA P MEASURING SYSTEM GSE.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST [X] DOES [ ] DOES NOT CONTAIN HAZARDOUS OPERATIONS.

HAZARDS CONSIST OF PERSONNEL WORKING AT HEIGHTS.
THIS TEST IS PERFORMED IN NINE PARTS::
PARTS 1, 2, 3, 5 & 6 WILL BE PERFORMED IN THE VAB.
PARTS 4, 5, 7, 8 & 9 WILL BE PERFORMED AT THE PAD

1. RP-1 DELTA P SYSTEM CLEANLINESS - A CONTAMINATION ANALYSIS IS PERFORMED TO VERIFY THE PARTICLE COUNT AND MOISTURE LEVEL MEETS THE REQUIREMENTS OF KSC-C-123, LEVEL II.

2. HE PURGE PRESSURE SWITCH ACTUATION - A FUNCTIONAL VERIFICATION IS PERFORMED ON THE PRESSURE SWITCH.

3. HE FLOW RATE VERIFICATION - THE PROPER FLOW RATE IS VERIFIED IN THE RP-1 LEVEL SENSING, HIGH PRESSURE LINE.

4. RP-1 DELTA P SYSTEM LEAK AND FUNCTIONAL TEST - A LEAK CHECK IS PERFORMED ON THE LINES AND SOLENOIDS.

CONFIGURATION: 1. RP-1 PTCS TRANSDUCERS DISCONNECTED FROM SYSTEM.
2. RP-1 SENSING LINES CONNECTED TO PTCS TRANSDUCER RACK, VP-9, AND S/A 1A.
3. S-IB VEHICLE ERECTED.

CONTINUED PAGE 2 (ITEM 18)

6 REV.	DATE	REASON	Contractor Approval	KSC Approval
E	9/5/4	ASTP UPDATE	J D Owens 9/5/4	F Bryan 9/22
D	4/6/73	ADD TEST 8 & 9 (SENSE LINE PURGE & POST RP-1 LOADING TEST)	J D Owens 4/6/3	F Bryan 4/6
C	2/27/73	RP-1 SENSE LINE PRESS DECAY TEST ADDED LOX TEST EXPANDED TO INCLUDE SCM 4	J D Owens 2/27/3	F Bryan 3/8
B	10/31/2	INCLUDE LOX DELTA P SYSTEM	J D Owens 11/2	F Bryan 11/9/72
A	9/28/2	CHANGE HAZARDS	9/28/2 S/J.D. OWENS	9/29/2 S/F. BRYAN

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
S/J. D. OWENS	5-8771 THE BOEING COMPANY	MAY 10, 1972
10. NASA-KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
S/FRANK BRYAN	LV-ENG	MAY 15, 1972

KSC FORM 23-336B (7/67)

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
SATURN IB LOX & RP-1 DELTA P SENSE LINES QUALIFICATION TEST

2. KSC TEST NUMBER
V-20107

3. EFFECTIVITY
AS-206 AND SUBS.

13. LOCATION
ML-1/VAB/PAD

14. COMPUTER PROG. IDENTIFICATION
N/A

15. EST. TEST TIME
24 HOURS

16. SUPPORT REQUIREMENTS

BOEING, PNEUMATICS (6000 PSI GN2 AND HE TOWER SUPPLY)
BOEING, SWING ARMS (S/A-1A ONLY)
BOEING, PTCS & PROPELLANT POWER
BENDIX, CONTAMINATION ANALYSIS
FACILITY COMMUNICATIONS (OIS)
CCSD, LUT NETWORKS
CCSD, STAGE
FEC, MEASUREMENTS

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

65ICD9890

18. ITEM CONTINUATION

ITEM 5 CONTINUED

5. SET-UP FOR LOX DELTA P SENSE LINES PRESSURIZATION - A PROCEDURE IS OUTLINED FOR PRESSURIZING LOX DELTA P LINES.

6. LOX DELTA P SYSTEM CLEANLINESS - A CONTAMINATION ANALYSIS IS PERFORMED TO VERIFY THE PARTICLE COUNT AND MOISTURE LEVEL MEETS THE REQUIREMENTS OF KSC-C-123, LEVEL II.

7. LOX DELTA P SYSTEM LEAK TEST - A LEAK TEST IS PERFORMED ON LOX DELTA P LINES.

8. RP-1 HIGH & LOW PRESS SENSE LINE PURGES FOR RP-1 LOADING - PURGE RP-1 SENSE LINES WITH HE.

9. POST TEST RP-1 LOADING SENSE LINE TEST - TEST FOR GAS IN HIGH PRESSURE SENSE LINES, PERFORM PRESSURE DECAY TEST.

TEST REQUIREMENTS

NONE

KSC FORM 23-336C (7-67)

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
VAB MOBILE LAUNCHER 1 LOX AND FUEL LEAK CHECKS

2. KSC TEST NUMBER
V-20108

3. EFFECTIVITY
AS-206 AND SUBS

4. TEST OBJECTIVES

TO VERIFY COMPLIANCE WITH LEAK REQUIREMENTS FOR SERVICE ARM AND FILL MAST PORTIONS OF THE LOX AND FUEL (RP-1 & LH2) FILL,SYSTEMS, VEHICLE VENT SYSTEMS, AND LH2 HEAT EXCHANGER.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST [X] DOES [ ] DOES NOT CONTAIN HAZARDOUS OPERATIONS.

HAZARDS INCLUDE: A. PERSONNEL WORKING AT HEIGHTS.

VEHICLE LEAK CHECKS WILL NOT BE PERFORMED. PRESSURIZATION WILL BE DONE USING HELIUM AND GN2. LEAK DETECTION WILL BE ACCOMPLISHED USING LEAK CHECK SOLUTION, USON AND MASS SPECTROMETER. RETEST WILL BE PERFORMED PER THIS PROCEDURE.

S-IVB TURBINE START BOTTLE VENT LINE AND PUMP SEAL BLEED LINE WILL BE DISCONNECTED AND PLUGGED AT VEHICLE AND FACILITY GH2 VENT SYSTEM INTERFACES. VEHICLE GH2 VENT LINE WILL BE DISCONNECTED FROM THE S-IVB AND BLIND FLANGED, AND A MANUAL VALVE INSTALLED AT LUT DISCONNECT. SKID VALVES WILL BE CLOSED AND DEBRIS VALVES WILL BE CLOSED OR LINES CAPPED.

LEAK CHECKS WILL BE PERFORMED AS FOLLOWS: THE S-IB LOX AND RP-1 FILL AND DRAIN LINES FROM THE MAST CUT-OFF VALVES TO THE VEHICLE FILL AND DRAIN VALVES WILL BE PRESSURIZED WITH HELIUM (LOX) AND GN2 (RP-1) USING S-IB STAGE PRESSURE. PRESSURIZE LOX AND LH2 FILL LINES ACROSS S-IVB AFT SERVICE ARM (S/A 6) USING "K" BOTTLES AND CHECK FOR LEAKS; PRESSURIZE VEHICLE GH2 VENT LINE ACROSS S-IVB FORWARD SERVICE ARM (S/A 7) AND DOWN TO LUT DISCONNECT USING 700 PSIG HELIUM SUPPLY AND CHECK FOR LEAKS; AND PRESSURIZE START BOTTLE VENT LINE AND PUMP SEAL BLEED LINE USING GHE "K" BOTTLES AND CHECK FOR PRESSURE DECAY. PRESSURIZE LH2 HEAT EXCHANGER VENT & CHECK. UPON COMPLETING CHECKS, EACH SYSTEM WILL BE VENTED AND RETURNED TO STANDBY CONFIGURATION.

TEST REQUIREMENTS:
NONE

6. REV	DATE	REASON	Contractor Approval	KSC Approval
E	10/5/72	ASTP UPDATE	J.D. Owens 9/5/72	[illegible]
D	4/5/73	ADD LH2 HEAT EXCHANGER VENT	J.D. Owens 4/9/73	[illegible]
C	11/28/73	CHANGE S-IB LOX PRESSURIZATION TO GHE	J.D. Owens 11/28/73	[illegible]
B	9/11/72	DELETE PRESSURIZED OVER 50% OF BURST	J.D. Owens 9/11/72	[illegible]
A	7/12/72	CHANGE PRESSURIZATION METHOD	J.D. Owens 7/12/72	[illegible]

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
S/J. D. OWENS	S-8771	NOV. 18, 1971
10. NASA-KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
S/FRANK BRYAN	LV-ENG	12/6/71

KSC FORM 23-338B (7-67)

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
VAB MOBILE LAUNCHER 1 LOX AND LH2 FUEL LEAK CHECKS

2. KSC TEST NUMBER
V-20108

3. EFFECTIVITY
AS-206 AND SUBS

13. LOCATION
VAB-ML 1

14. COMPUTER PROG IDENTIFICATION
N/A

15. EST TEST TIME
40 HOURS

16. SUPPORT REQUIREMENTS

MASS SPECTROMETER W/OPERATOR
KSC SAFETY
OIS
RD 28300

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

18. ITEM CONTINUATION

KSC FORM 23-338C (7-67)

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REV 32

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1 TEST TITLE
SATURN IB LAUNCH VEHICLE CONTROL PROCEDURE
FOR TRANSFER OF S/V TO THE PAD

ASE TEST NUMBER
TP-30100

3 EFFECTIVITY
AS-206 AND SUBS

4 TEST DESCRIPTION (SUMMARY AND PURPOSE)

THIS PROCEDURE CONSISTS OF THREE (3) PARTS REQUIRED TO (1) PREPARE THE LAUNCH VEHICLE FOR TRANSFER TO PAD, (2) RECEIPT OF THE LAUNCH VEHICLE AT THE PAD AND PREPARATIONS FOR COMPLETION OF TRANSFER, (3) CLOSE THE MOBILE SERVICE STRUCTURE (MSS) TO THE MLP/LAUNCH VEHICLE, (4) TRANSFER ML & [illegible] TO ZERO [illegible].

5 TEST DESCRIPTION (CONTINUED)

THIS TEST DOES DOES NOT CONTAIN HAZARDOUS OPERATIONS.

PURPOSE OF SERVICES

A. [illegible]
B. [illegible] CRAWLER OPERATION
C. [illegible]
D. [illegible]
E. [illegible]
F. [illegible]

PART I OF THE [illegible] PROCEDURE FOR TRANSFER TO THE PAD IS IN ACCORDANCE WITH THE [illegible] OF THE PAD DISASTER PLAN. THE PROCEDURE CONSISTS OF THE [illegible] SECTION. THE PRE-HYPERGOLING STEPS SECTION OF THIS PROCEDURE [illegible] ENVIRONMENTAL CONDITIONS AND REQUIREMENTS FOR THE [illegible] AND ALL HYPERGOLIC SERVICING.

PART II OF THE OPERATING STEPS STARTS WITH PREPARATIONS FOR TRANSFER AND ENDS WITH THE [illegible] TRANSFER TO PAD.

PART III OF THE [illegible] STEPS STARTS WITH ARRIVAL OF LAUNCH VEHICLE AT THE PAD AND [illegible] ELECTRICAL CONNECTIONS AND REGROUP OF PNEUMATICS AND UMBILINE CABLES AT THE PAD.

[illegible] PERTAINS TO THE MOBILE LAUNCHER TASKS ASSOCIATED WITH MSS [illegible] AT THE PAD.

[illegible] ARE THE APPROPRIATE STEPS REQUIRED TO SECURE ML & LV [illegible] AND RETURN MLP TO PARK.

[illegible]		12 [illegible] 10/71	[illegible]
[illegible]		[illegible] 10/71	[illegible] 11/13/71
[illegible]	STATION	Contractor Approval	KSC Approval
[illegible]	9 ORGANIZATION	12 DATE	
[illegible]	[illegible]	[illegible] 3, 1971	
[illegible]	ORGANIZATION	12 APPROVAL DATE	
Dr. Fred Brown	LV-EN-6	9/13/71	

KSC FORM 23-3480 (7-67)

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1 TEST TITLE
SATURN IB LAUNCH VEHICLE CONTROL PROCEDURE
FOR TRANSFER OF S/V TO THE PAD

ASE TEST NUMBER
TP-30100

3 EFFECTIVITY
AS-205 AND SUBS

13 LOCATION
LC-39

14. COMPUTER PROG. IDENTIFICATION
N/A

15 EXECUTION TIME
[illegible] HOURS

16. SUPPORT REQUIREMENTS

KSC PAD SAFETY
SECURITY POLICE
FIRE FIGHTING
MEDICAL
GSE MEASURING (LVO)
GSE MEASURING (INS)
LCC MEASURING (INS)
LCC MEASURING (LVO)
SERVICE STRUCTURE MEASURING
SPACE VEHICLE EGS
FACILITY TV (OTV)
FACILITY COMM. (OIS)
SEARCH LIGHTS
WEATHER FORECAST

RD-25003

17 OTHER APPLICABLE REFERENCE DOCUMENTATION

19 ITEM CONTINUATION

5. TEST DESCRIPTION (CONTINUED)

TEST REQUIREMENTS:

(LV) TM-011-001-24 8.0.1, 8.0.3, 8.0.1.1, 9.0.1.2

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE

SATURN IB LAUNCH VEHICLE CONTROL PROCEDURE FOR RETURN OF S/V TO THE VAB

2. KSC TEST NUMBER: V-20110

3. EFFECTIVITY: AS-206 AND SUBS

4. TEST OBJECTIVES

THE OBJECTIVE OF THIS PROCEDURE IS TO PRESENT OPEPATIONS REQUIRED TO ACHIEVE THE FOLLOWING TASKS: 1) PREPARE THE LAUNCH VEHICLE FOR RETURN OF THE S/V FROM THE PAD TO THE VAB, 2) RETRACTION OF THE MOBILE SERVICE STRUCTURE (MSS) FROM THE LUT/VEHICLE, 3) PREPARE LAUNCH VEHICLE FOR TEMPORARY STAY IN THE VAB.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST [X] DOES [ ] DOES NOT CONTAIN HAZARDOUS OPERATIONS.

HAZARDS: A. CRAWLER HIGH PRESSURE HYDRAULICS & CRAWLER OPERATION
B. PLATFORM RETRACTION & EXTENSION
C. HIGH WIND HAZARDS
D. WORK AT HEIGHTS
E. ELECTRICAL STORM HAZARDS

THE LAUNCH VEHICLE CONTROL PROCEDURE FOR RETURN OF THE SV TO THE VAB IS IN ACCORDANCE WITH THE OVERALL GUIDELINES OF THE DLO TRANSFER PLAN. THIS PROCEDURE CONSISTS OF PRE-TRANSFER CONDITIONS AND OPERATING STEPS. THE PRE-TRANSFER CONDITIONS SECTION OF THIS PROCEDURE PROVIDES A CHECK LIST OF PRE-MOVE CONDITIONS AND REQUIREMENTS FOR THE LAUNCH VEHICLE AND GSE.

PART I OF THE OPERATING STEPS STARTS WITH PREPARATIONS FOR THE TRANSFER AND ENDS WITH THE LAUNCH VEHICLE TRANSFER TO THE VAB.

PART II OF THE OPERATING STEPS STARTS WITH ARRIVAL OF LAUNCH VEHICLE AT THE VAB AND ENDS WITH THE COMPLETION OF SECURING OPERATIONS AND CONNECTION OF ECS.

TEST REQUIREMENTS

NONE

6. REV	DATE	REASON	Contractor Approval	KSC Approval
B	9/14	ASTP UPDATE	J D Owens 9/13/72	F Boyer 9/22
A	11/14/2	CHANGE PART I, ADD RD NO.	J D Owens 11/14/2	C W Dowling 11/15/72

7. CONTRACTOR APPROVAL: J. D. Owens
8. ORGANIZATION: S-ESTI
9. DATE: August 31, 1971
10. NASA/KSC APPROVAL: Frank Boyer
11. ORGANIZATION: LV-ENG
12. APPROVAL DATE: 9/13/71

KSC FORM 23-938B (7/67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE

SATURN IB LAUNCH VEHICLE CONTROL PROCEDURE FOR RETURN OF S/V TO THE VAB

2. KSC TEST NUMBER: V-20110

3. EFFECTIVITY: AS-206 AND SUBS

13. LOCATION	14. COMPUTER PROC. IDENTIFICATION	15. EST. TEST TIME
LC-39	N/A	22 HOURS

16. SUPPORT REQUIREMENTS

KSC PAD SAFETY
SECURITY POLICE
FIRE FIGHTING
MEDICAL
LCC MEASURING (LVO)
LCC MEASURING (INS)
GSE MEASURING (LVO)
GSE MEASURING (INS)
SERVICE STRUCTURE MEASURING
SPACE VEHICLE ECS
FACILITY TV (OTV)
FACILITY COMMUNICATIONS (OIS)
SEARCH LIGHTS
WEATHER FORECAST

RD-25003

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

18. ITEM CONTINUATION

KSC FORM 23-938C (7/67)

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
SATURN IB VERIFICATION TEST AFTER LIGHTNING STRIKE

2. KSC TEST NUMBER
V-20111

3. EFFECTIVITY
AS-206 AND SUBS

4. TEST OBJECTIVES

TO VERIFY OPERATION OF VULNERABLE COMPONENTS, CHECK ELECTRONIC SYSTEMS, AND ESTABLISH OVERALL SYSTEM CONFIDENCE AFTER A LIGHTNING STRIKE.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST [X] DOES [ ] DOES NOT CONTAIN HAZARDOUS OPERATIONS.

HAZARDOUS OPERATIONS:

A. HIGH PRESSURE GASES
B. REMOVAL OF ORDNANCE INITIATORS AND DETONATORS

AFTER CONFIRMATION OF A LIGHTNING STRIKE ON THE VEHICLE AT THE PAD, APPROPRIATE PARTS OF THIS TEST WILL BE RUN. PART I IS A CHECK OF THE MOST VULNERABLE COMPONENTS. PART II IS A MORE COMPREHENSIVE CHECK OF THE ELECTRONICS SYSTEMS. PART III WILL ESTABLISH OVERALL SYSTEM CONFIDENCE AFTER A DATA ANOMALY OR A VISUAL INSPECTION HAS REVEALED DAMAGE.

PART I - WILL BE PERFORMED UPON CONFIRMATION OF A LIGHTNING STRIKE, WHEN DATA IS AVAILABLE, NO ANOMALIES IN DATA WERE OBSERVED AND A VISUAL INSPECTION REVEALED NO DAMAGE.

PART IA - WILL BE PERFORMED PRIOR TO T-9 HOURS IN CDDT AND LCD.

PART IB - WILL BE PERFORMED AFTER T-9 HOURS IN CDDT AND LCD.

PART II - TO BE RUN IN UNKNOWN SITUATIONS. DATA IS NOT AVAILABLE TO CONFIRM SYSTEMS STATUS.

PART III - WILL BE RUN ONLY IF SUFFICIENT DATA DISCREPANCIES OR PHYSICAL DAMAGE WARRANTS SUCH ACTION. PORTIONS OF THIS PART WHICH ARE TO BE RUN WILL BE DEPENDENT ON VEHICLE CONFIGURATION. AFTER REMOVAL OF ORDNANCE INITIATORS AND DETONATORS PART II WILL BE RUN TOGETHER WITH ANY STAGE PECULIAR TESTS NOT RUN IN PART II WHICH MAY BE REQUIRED TO ESTABLISH OVERALL SYSTEM CONFIDENCE.

6. REV	DATE	REASON	Contractor Approval	KSC Approval
C	9/15/72	ASTP UPDATE	J D Owens 9/15/72	F Bryan 9/22
B	4/23/73	REVISES IVAR LIST & TEST REQUIREMENTS	J D Owens 4/23/73	Frank Bryan 4/24/73
A	12/8/72	ADDS IVAR LIST; ADDS TEST REQUIREMENTS; DEFINES PARTS IA & IB; UPDATES PART III	J D Owens 12/8/72	Ringell 12-15-72

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
S/J. D. OWENS	BATC, 5-8771	9/20/71
10. NASA KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
S/F. BRYAN	LV-ENG	2/3/72

KSC FORM 23-338B (7-67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
SATURN IB VERIFICATION TEST AFTER LIGHTNING STRIKE

2. KSC TEST NUMBER
V-20111

3. EFFECTIVITY
AS-206 AND SUBS

13. LOCATION
LC-39

14. COMPUTER PROC. IDENTIFICATION
SEE LIST IN BLOCK 18

15. EST. TEST TIME
VARIABLE

16. SUPPORT REQUIREMENTS

FACILITY COMMUNICATIONS (OIS)
FACILITY TV (OTV)
ALL STAGE POWER
DEE-6
DDAS
RCA-110A COMPUTERS
FACILITY ECS
COUNTCLOCK
BACKUP BATTERIES
LCC MEASURING (LVO)
GSE MEASURING (LVO)

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

18. ITEM CONTINUATION

COMPUTER PROGRAM IDENTIFICATIONS

CTB2	FT06	FT25	FT45	LA01	MT01		EAIC
FE50	FT08	FT31	FT47	LAF2	OALR	OATO	EALR
FT03	FT10	FT35	FT49	LAPW	OALS	IASP	EAPS
FT04	FT20	FT37	FT55	LAM2	OAPU	IATC	EAPU
FT05	FT23	FT43	GT16	LASW	OAR1	IASL	EASS

TEST REQUIREMENTS:

(LV) TM-011-001-2H 13.0.1 THRU 13.3.1.4.3

KSC FORM 23-338C (7/67)

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE

SATURN IB PAD MOBILE LAUNCHER LOX AND FUEL LEAK CHECKS

2. KSC TEST NUMBER
V-20112

3. EFFECTIVITY
AS-206 AND SUBS

4. TEST OBJECTIVES

TO VERIFY COMPLIANCE WITH LEAK REQUIREMENTS FOR THE MOBILE LAUNCHER LOX/FUEL FILL AND THE FACILITY VENT SYSTEMS AND THE LH2 TRANSFER AND VEHICLE VENT SYSTEM.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST ☒ DOES ☐ DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

HAZARDS INCLUDE:

A. PERSONNEL WORKING AT HEIGHTS
B. INERT ATMOSPHERES

S-IVB PROPELLANT AND VENT LINES WILL BE PRESSURIZED UP TO THE VEHICLE INTERFACE. PRESSURIZATION WILL BE DONE USING GHE FROM "K" BOTTLES AND PURGE SUPPLIES. LEAK DETECTION WILL BE PERFORMED WITH LEAK CHECK SOLUTION, USON, MASS SPECTROMETER AND PRESSURE DECAY OBSERVATION. THE ML SYSTEMS WILL BE LEAK CHECKED FROM THE VEHICLE INTERFACES TO THE GROUND FACILITY INTERFACES.

S-IB LOX AND RP-1 FILL LINES WILL BE PRESSURIZED USING HELIUM AND GN2 RESPECTIVELY FROM S-IB STAGE TANKS UP TO THE LOX DEBRIS VALVE AND RP-1 MAST CUTOFF VALVE. LEAK DETECTION WILL BE PERFORMED WITH LEAK CHECK SOLUTION AND MASS SPECTROMETER

DETECTED LEAKS WILL BE REPAIRED AND THEN RETESTED PER THIS PROCEDURE.

THE S-IVB TURBINE START BOTTLE AND PUMP SEAL BLEED VENT LINES WILL NOT BE CONNECTED TO THE VEHICLE, THE S-IVB GH2 VENT LINE WILL REMAIN CONNECTED TO THE VEHICLE WITH THE VENT VALVE CLOSED. S-IVB SKID VALVES AND THE FILL & DRAIN VALVES WILL BE CLOSED AND THE DEBRIS VALVES OPEN.

THE S-IB LOX FILL & DRAIN VALVE WILL BE CLOSED, AFTER PRESSURIZATION, AND THE LOX DEBRIS VALVE WILL BE CLOSED. THE S-IB RP-1 FILL & DRAIN VALVE WILL BE OPEN AND THE RP-1 MAST CUTOFF VALVE CLOSED.

6 REV.	DATE	REASON	Contractor Approval	KSC Approval
E	10/15/74	ASTP UPDATE	11/5/74	11/6/74
D	7/5/73	ADD TURBINE START BOTTLE & PUMP SEAL BLEED LINES CHK.	7/5/73	7/6/73
C	12/15/72	ADD S-IB RP-1 MAST LEAK CHECKS CHANGE TITLE	12/15/72	12/14/72
B	3/12/72	CHANGE S-IVB REQUIREMENTS, ADD RD NUMBER	S/J. D. OWENS	S/F. BRYAN

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
S/J. D. OWENS	5-8771	SEPT. 16, 1971
10. NASA KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
S/FRANK BRYAN	LV-ENG	9/28/71

KSC FORM 23-338B (7-67)

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

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1. TEST TITLE

SATURN IB PAD MOBILE LAUNCHER LOX AND FUEL LEAK CHECKS

2. KSC TEST NUMBER
V-20112

3. EFFECTIVITY
AS-206 AND SUBS

13. LOCATION	14. COMPUTER PROC. INDENTIFICATION	15. EST. TEST TIME
PAD B	N/A	40 HOURS

16. SUPPORT REQUIREMENTS

KSC SAFETY
MASS SPECTROMETER/OPERATOR
F&E MEASUREMENTS
OIS
LUT PNEUMATICS
GROUND PNEUMATICS
LCC POWER
RD 28301

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

18. ITEM CONTINUATION

5. TEST DESCRIPTION (CONTINUED)

LEAK CHECKS WILL BE PERFORMED AS FOLLOWS:
- S-IVB LH2 HEAT EXCHANGER VENT LINE
- S-IB LOX FILL LINE
- S-IB RP-1 FILL LINE
- S-IVB LH2 SKID AND S/A 6 LH2 & LOX FILL LINES
- ML LH2 TRANSFER LINES
- S-IVB LH2 SKID VALVE SEATS
- S/A 7 GH2 VEHICLE VENT LINE
- S-IV TUBINE START BOTTLE & PUMP SEAL BLEED LINES

UPON COMPLETION OF THE LEAK CHECKS, ALL SYSTEMS WILL BE VENTED AND CONFIGURED TO STANDBY CONFIGURATION.

TEST REQUIREMENTS

(LV)	TM-011-001-2H	NONE
(S-IB)	60C06050	NONE
(S-IVB)	1B86721	0.2.4.4 REQT, 2.1, 2.2 0.2.4.6 REQT, 1.6.1, 1.6.2, 2.1, 2.2
(IU)	7921601	NONE

KSC FORM 23-338C (7-67)

REV 32

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE: SATURN IB SPECIAL INFLIGHT LIGHTNING TEST

2. KSC TEST NUMBER: V-20113

3. EFFECTIVITY: AS-210

4. TEST OBJECTIVES

TO SUBJECT THE SATURN IB LAUNCH VEHICLE TO A SERIES OF SIMULATED LIGHTNING STRIKES TO DETERMINE THE SAFETY MARGINS INHERENT IN THE DESIGN OF CRITICAL ELECTRIC/ELECTRONIC CIRCUITS.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST X DOES ☐ DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

HAZARDOUS OPERATIONS:

A. UMBILICALS EJECTED

THE LAUNCH VEHICLE WILL BE ERECTED ON THE MOBILE LAUNCHER IN THE VAB. ALL STAGES WILL BE MECHANICALLY AND ELECTRICALLY MATED. THE LAUNCH VEHICLE WILL BE PREPARED AND FUNCTIONALLY CHECKED IN AN ABBREVIATED COUNTDOWN DURING WHICH THE TM, RF, RSCR, G&C, POWER AND EDS SYSTEMS WILL BE VERIFIED. A PROPELLANT DISPERSION TEST WILL BE RUN. THE COUNT WILL PROCEED NORMALLY THROUGH "PREPARATIONS COMPLETE" AND INITIATION OF THE FIRING COMMAND. THE TERMINAL COUNT SEQUENCE WILL PROCEED THROUGH COMMIT. LIFTOFF WILL BE SIMULATED BY SERVICE ARM CONTROL SWITCH OPERATION TO COMMAND UMBILICAL EJECTION AND WITHDRAWAL. LV ECS WILL BE TERMINATED AT UMBILICAL DISCONNECT. SERVICE ARMS 1A, 6, 7 & 8 WILL NOT BE RETRACTED. SERVICE ARM 9 WILL BE RETRACTED A MINIMUM OF ONE (1) FOOT. EXCEPT FOR PLUGS OUT CONFIGURATION, THE LAUNCH VEHICLE WILL BE ELECTRICALLY AND MECHANICALLY SEPARATED FROM THE GSE AFTER LIFTOFF TO SIMULATE FLIGHT CONDITIONS AS CLOSELY AS POSSIBLE. THE FLIGHT COMPUTER WILL PROGRAM THE LAUNCH VEHICLE THROUGH AN ABBREVIATED FLIGHT SEQUENCE THROUGH TIME BASE 1. THE TEST WILL BE TERMINATED AFTER THE SIMULATED LIGHTNING STRIKE AND THE LAUNCH VEHICLE WILL BE POWERED DOWN BY DCS AND THE SPECIAL FLIGHT PROGRAM.

TEST REQUIREMENTS: NONE

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
A	9/5/?	ASTP UPDATE	F. Owens 9/11/74	F. Bryan 9/22

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
F. Owens	W-4850	June 26, 1974

10. NASA KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
Frank ? Bryan 6/26/74	LV-ENG	6/28/74

KSC FORM 23-338 (7/67)

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE: SATURN IB SPECIAL INFLIGHT LIGHTNING TEST

2. KSC TEST NUMBER: V-20113

3. EFFECTIVITY: AS-210

13. LOCATION: VAB

14. COMPUTER PROC. IDENTIFICATION: IALL, IATS

15. EST. TEST TIME: 10 DAYS

16. SUPPORT REQUIREMENTS

- GROUND POWER
- S-IB STAGE POWER
- S-IVB STAGE POWER
- IU POWER
- FLIGHT BATTERIES
- BACKUP BATTERIES
- COUNTDOWN CLOCK
- OAT EQUIPMENT
- LSE POWER
- LCC MEASURING (LVO)
- GSE MEASURING (LVO)
- DDAS
- DDAS TAPE RECORDING
- RCA 110A COMPUTERS
- LV W-G ECS
- LV ECS (GAS)
- LOCAL COMMAND CARRIER (DRSCS & IU)
- CIF
- IU RF STATION

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

18. ITEM CONTINUATION

KSC FORM 23-338C (7/67)

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REV 32

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1 TEST TITLE
SATURN IB LAUNCH VEHICLE PROPELLANT SIMULATED LOADING

2 KSC TEST NUMBER
V-20114

3 EFFECTIVITY
AS-207 AND SUBS

4 TEST OBJECTIVES
TO VERIFY THAT THE PROPELLANT SYSTEM WILL PROPERLY CONTROL THE AUTOMATIC LOADING AND DRAIN OF A SATURN IB VEHICLE.

5 TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT CONTAIN HAZARDOUS OPERATIONS.

THE PROPELLANT SYSTEMS WILL BE OPERATED IN FILL, REPLENISH, LIFTOFF, AND DRAIN MODES FOR THE LV WITHOUT ACTUALLY TRANSFERRING LIQUID PROPELLANTS.

THE SIMULATED LOADING OPERATION WILL BE RUN ONLY DURING MALFUNCTION DAT AND FRT.

THE PTCS WILL BE UTILIZED TO PROVIDE SIMULATED LIQUID LEVEL INDICATIONS FOR EACH STAGE.

THE LAUNCH VEHICLE WILL BE LOCATED ON THE PAD AND ELECTRICALLY MATED.

TEST REQUIREMENTS:

LV	TM-011-001-2H	NONE
S-IB	60C06050	3.5.2.2, 3.5.2.4
S-IVB	1B86721	NONE
IU	7921601	NONE

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
C	4/15/74	ASTP UPDATE	4/5/74	4/22
B	4-9-73	DELETE TERM COUNT SEQ'S & CUTOFFS FOR AS-207	4/9/73	4/10
A	11-8-72	CHANGE CUTOFFS AND TEST REQUIREMENTS	11/7/2	12/8

7 CONTRACTOR APPROVAL	8 ORGANIZATION	9 DATE
	5-8571	Sept 2, 1971
10 NASA-KSC APPROVAL	11 ORGANIZATION	12 APPROVAL DATE
	LV-ENG	3/14/72

KSC FORM 23-338B (7-67)

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
SATURN IB LAUNCH VEHICLE PROPELLANT SIMULATED LOADING

2 KSC TEST NUMBER
V-20114

3 EFFECTIVITY
AS-207 AND SUBS

13. LOCATION	14 COMPUTER PROG. IDENTIFICATION	15 EST. TEST TIME
LC-39 PAD B	N/A	7 HOURS

16 SUPPORT REQUIREMENTS

RCA 110A COMPUTER
LV POWER UP
DTS
DEE-3
PROPELLANT DC POWER
PTCS
LSE POWER UP

RD-26031

17 OTHER APPLICABLE REFERENCE DOCUMENTATION

18. ITEM CONTINUATION

KSC FORM 23-338C (7-67)

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KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE

SATURN IB LAUNCH VEHICLE OPERATIONS FOR FACILITY POWER OUT TEST

2. KSC TEST NUMBER: V-20115

3. EFFECTIVITY: AS-206 AND SUBS

4. TEST OBJECTIVES

THIS TEST WILL VERIFY THE CAPABILITY TO RESUME COUNT OR TO DRAIN CRYOGENIC PROPELLANTS FROM THE LAUNCH VEHICLE AND OTHERWISE SAFE AND SECURE THE LAUNCH VEHICLE AND GSE IN THE EVENT OF LOSS OF COMMERCIAL POWER TO LAUNCH COMPLEX 39.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST XX DOES ☐ DOES NOT CONTAIN HAZARDOUS OPERATIONS.

HAZARDOUS OPERATIONS:

(A) THE ML AND PTCR WILL BE PRESSURIZED.
(B) LIQUID NITROGEN WILL BE HANDLED IN THE HGD SYSTEM.

THE TEST WILL BE CONDUCTED WITH THE SPACE VEHICLE AT THE PAD. ALL SPACE VEHICLE AND SUPPORT SYSTEMS ARE REQUIRED TO BE IN A SIMULATED T-2 HOUR LAUNCH COUNTDOWN CONFIGURATION AS CLOSELY AS POSSIBLE. THE LV PROPELLANT STIMULATED LOADING TEST, V-20114, WILL BE RUN UNTIL THE REPLENISH MODE HAS BEEN ESTABLISHED. ALL SYSTEMS AND EQUIPMENT WILL BE ELECTRICALLY LOADED WITH ACTUAL OR DUMMY LOADS, AND EMERGENCY GENERATORS RUNNING.

POWER FAILURES ON LCC, PAD A & B INDUSTRIAL AND INSTRUMENTATION BUSSES WILL BE SIMULATED. A MOMENTARY FAILURE WILL BE INITIATED TO TEST THE ABILITY TO RECOVER AND PICK UP COUNT AT T-2 HOURS, ALSO A QUICK RECOVERY OF THE 110A GROUND COMPUTER WILL BE INITIALIZED TO PROVIDE SUPPORT WITHIN 20 MINUTES AFTER THE FIRST OUTAGE. AN EXTENDED POWER OUTAGE (40 MINUTE) WILL BE INITIATED TO TEST THE CAPABILITY FOR RECOVERY AND SECURING ON EMERGENCY POWER, INCLUDING SAFING AND DRAINING OF THE LAUNCH VEHICLE.

AFTER POWER IS RESTORED, EACH USER WILL PROVIDE AN APPROXIMATE LOAD PROFILE OF EACH BUS TO CLES. THIS PROFILE SHALL INCLUDE ACTUAL CURRENTS EXPERIENCED WHILE ON BACKUP BATTERIES DURING POWER OUTAGE, AND SHALL BE EXTRAPOLATED TO INDICATE CURRENT REQUIREMENTS FOR A-TOTAL DRAIN.

TEST REQUIREMENTS:
NONE

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
C	9/5/74	ASTP UPDATE	J.D. Owens 9/1/74	F. Bryan 9/22
B	8/7/72	ADD PAD A & RD NO., CHG. HAZ. OPERATIONS	J.D. Owens 8/15/72	F. Bryan 8/22/72
A	5/17/72	ADD MOMENTARY POWER OUTAGE	S/J.D.OWENS	S/F.BRYAN

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
S/L. R. CORBRIDGE	5-8771	3/10/72
10. NASA-KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
S/FRANK BRYAN	LV-ENG	3/14/72

KSC FORM 23-336B (7.67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE

SATURN IB LAUNCH VEHICLE OPERATIONS FOR FACILITY POWER OUT TEST

2. KSC TEST NUMBER: V-20115

3. EFFECTIVITY: AS-206 AND SUBS

13. LOCATION	14. COMPUTER PROG. IDENTIFICATION	15. EST. TEST TIME
LC-39 PAD A & B	LA01, OAPU, NT98, NT99 EAIC, EAPS, EASS, IASP,	3 HOURS

16. SUPPORT REQUIREMENTS

110A COMPUTER
LV POWER UP
DTS
DEE-3
PTCS
PROPELLANT DC POWER
LSS POWER UP
BACKUP BATTERIES
OTV
OTV LIGHTING
INDUSTRIAL WATER

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

V-20114 - LAUNCH VEHICLE PROPELLANT SIMULATED LOADING TEST

18. ITEM CONTINUATION

KSC FORM 23-336C (7.67)

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REV 32

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 3

1. TEST TITLE
SATURN IB LAUNCH VEHICLE PROPELLANT LOADING AND ALL SYSTEMS TEST

2. KSC TEST NUMBER
V-20116

3. EFFECTIVITY
AS-206 AND SUBS

4. TEST OBJECTIVES

1. TO DEMONSTRATE THE TIME PHASING OF THE SEQUENCES NECESSARY TO LOAD CRYOGENIC PROPELLANTS ABOARD THE LAUNCH VEHICLE.
2. TO DEMONSTRATE THE TIME PHASING OF COMPUTERIZED TEST AND CHECKOUT PROGRAMS REQUIRED TO PREPARE THE LAUNCH VEHICLE FOR LAUNCH.
3. TO DEMONSTRATE ABILITY TO SAFE AND DRAIN THE LAUNCH VEHICLE.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST ☒ DOES ☐ DOES NOT CONTAIN HAZARDOUS OPERATIONS.

TEST OPERATIONS ARE CONSIDERED HAZARDOUS FOR THE FOLLOWING REASONS:

1. RP-1 WILL BE LOADED
2. PROPELLANT TANKS AND GAS STORAGE SPHERES WILL BE PRESSURIZED
3. HAZARDOUS ENVIRONMENTAL CONDITIONS MAY BE ENCOUNTERED
4. CRYOGENIC LIQUIDS WILL BE LOADED
5. HEAVY EQUIPMENT MOVEMENTS WILL BE REQUIRED

CONFIGURATION

THE LAUNCH VEHICLE MUST BE ON THE PAD WITH ALL PREREQUISITE TESTS COMPLETED.

TEST DESCRIPTION

THE PROCEDURE WILL BE ORGANIZED AS FOLLOWS:

1. PART 1 WILL COVER LAUNCH VEHICLE TANK PURGES & RP-1 LOADING.

2. PART 2 WILL COVER BATTERY SIMULATOR INSTALLATION, LOX & LH2 SYSTEM PREPS, MSS MOVE TO PARK SITE, PROPELLANT TANKING COMPUTER SYSTEM PREPS, INDUSTRIAL WATER SYSTEM PREPS, ELECTRICAL SUPPORT PREPS, VEHICLE CLOSEOUT AND OTHER SYSTEMS PREPS REQUIRED TO SIMULATE A T-8 HOUR LAUNCH DAY LAUNCH VEHICLE CONFIGURATION. ALL ITEMS NOT COMPATIBLE WITH CRYOGENIC PROPELLANT LOADING WILL BE REMOVED. THERE WILL BE NO SPACECRAFT INTERFACES, NO ORDNANCE INSTALLATION EXCEPT INERT PROPELLANT DISPERSION DEVICES AND NO S/A PRESSURIZATION.
(CONTINUED ON PAGE 2, SECTION 18).

TEST REQUIREMENTS: (SEE PAGE 3)

6. REV	DATE	REASON	Contractor Approval	KSC Approval
E	9/5/74	ADD UPDATE	J.D. Owens 9/11/74	F. Bryan 9/26
C	10/27/72	INCLUDE RP-1 DRAIN OPS	J.D. Owens 10/31/72	Frank Bryan 11/1
D	1/10/73	DELETE MANUAL POWER XFER APPENDIX	J.D. Owens 1/10/73	Frank Bryan

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
S/J. D. OWENS	5-8771 (TBC)	FEB. 22, 1972
10. NASA-KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
S/FRANK BRYAN	LV-ENG	FEB. 29, 1972

KSC FORM 23-338B (7-67)

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 3

1. TEST TITLE
SATURN IB LAUNCH VEHICLE PROPELLANT LOADING AND ALL SYSTEMS TEST

2. KSC TEST NUMBER
V-20116

3. EFFECTIVITY
AS-206 AND SUBS

13. LOCATION	14. COMPUTER PROG. IDENTIFICATION	15. EST. TEST TIME
LC-39B	SEE PAGE 3	4 DAYS

16. SUPPORT REQUIREMENTS

	DTS
GROUND POWER	DEE-3
S-IB STAGE POWER	DEE-6
S-IVB STAGE POWER	110A COMPUTERS
IU STAGE POWER	CM W-G ECS
ETR RANGE SAFETY	CCF
KSC PAD SAFETY	CIF
SECURITY POLICE	SEARCHLIGHTS
FIRE FIGHTING	DDAS
MEDICAL	TCE
PROPELLANTS DC POWER	
PTCS (ALL SYSTEMS)	

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

18. ITEM CONTINUATION

TEST DESCRIPTION (CONTINUED FROM PAGE 1, SECTION 5)

3. PART 3 WILL COVER PAD CLOSEOUT OPERATIONS, CRYO PROPELLANT LOADING, SPECIAL CRYOGENIC TESTS AND THE TERMINAL COUNT SEQUENCE. FROM T-8 HOURS THROUGH INTERRUPTION OF THE TERMINAL COUNT SEQUENCE AT TIME FOR S-IB ENGINE IGNITION, THIS PROCEDURE WILL RESEMBLE THE COUNTDOWN DEMONSTRATION TEST PROCEDURE, V-20130, AS CLOSELY AS PRACTICAL. HOWEVER THIS PROCEDURE WILL NOT INCLUDE Q-BALL OPERATIONS, S/A 9 OPERATIONS, RETRACTION OF PRIMARY DAMPER AT COMPLETION OF PROPELLANT LOADING, SERVICE MODULE DELUGE PURGE SYSTEM OPERATIONS, HOLDDOWN ARM PRESSURIZATION, AUXILIARY PROPULSION SYSTEM PROPELLANT LOADING, ENGINE SERVICE PLATFORM LOWERING, REMOVAL OF S/A CARRIER LOCKS, S/A TIP PRESSURIZATION, ORONITE ABOARD THE S-IB STAGE, SPACECRAFT INTERFACES, S-IB THRUST CHAMBER JACKET PREFILL AND FLIGHT BATTERY INSTALLATION.

4. APPENDICES WILL INCLUDE SAFING PROCEDURES; LOX & LH2 DRAIN; CONTINGENCY PROCEDURES (PROCEDURES TO ESTABLISH SAFE CONDITIONS FOR PAD ACCESS DURING CRYOGENIC PROPELLANT LOADING); RECYCLE OPERATIONS TO RETURN THE LV TO A T-15 MINUTE OR T-8 HOUR CONFIGURATION; POST TEST SECURING OPERATIONS, RP-1 DRAIN; AND GUIDELINES FOR EVALUATION OF TCS ANOMALIES.

KSC FORM 23-338C (7-67)

APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET (CONTINUATION SHEET) — PAGE 3 OF 3

TEST TITLE: SATURN IB LAUNCH VEHICLE PROPELLANT LOADING AND ALL SYSTEMS TEST

ABC TEST NUMBER: V-20116

EFFECTIVITY: AS-206 AND SUBS

TEST CONTINUATION

COMPUTER PROGRAM IDENTIFICATION (CONTINUED FROM PAGE 2, SECTION 14)

BCH2	CTC3	FE50	FT20	FT43	IAAP	IAPX	IZR1	NT98
BE00	CTC4	FT01	FT23	FT45	IAEC	IARS	IZH5	NT99
BT01	CTC5	FT13	FT25	FT47	IAFC	IASP	LAF2	OALB
CC10	EAC5	FT14	FT31	FT49	IAHD	IATC	LAPW	OALS
CTB1	EAIC	FT05	FT33	FT55	IALJ	IATS	LA01	OAPU
CTB2	EAPC	FT06	FT37	GE01	IALL	IZET	LZTU	OATO
CTB7	EAPU	FT10	FT42	GT10	IAMC	IZRC	MT01	
	EAOC							

TEST REQUIREMENTS (CONTINUED FROM PAGE 1, SECTION 5)

(S-IB)	00000080	3.5.2.3.1	3.5.2.5.1	3.5.2.6.1	3.3.0.1	
		3.5.2.3.2	3.5.2.5.2	3.5.2.6.2	3.3.6.4	
		3.5.2.3.3			3.3.2.4	(ALL)

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
SATURN IB LAUNCH VEHICLE OPERATIONS FOR LAUNCH VEHICLE OVERALL TEST #1 (PLUGS IN)

2. KSC TEST NUMBER
V-20117

3. EFFECTIVITY
AS-207 AND SUBS

4. TEST OBJECTIVES

TO VERIFY COMPATIBILITY AND PROPER OPERATION OF ALL LAUNCH VEHICLE AND GSE SYSTEMS DURING FIRING AND FLIGHT SEQUENCES, WITH SIMULATED UMBILICAL PLUG EJECTION AND SIMULATED LIFTOFF. THERE WILL BE TWO FLIGHT SEQUENCES, THE FIRST WILL VERIFY TIME BASE 2 INHIBIT. THE SECOND WILL VERIFY PROPER OPERATIONS OF THE LAUNCH VEHICLE THROUGH SIMULATED FLIGHT.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST [X] DOES [ ] DOES NOT CONTAIN HAZARDOUS OPERATIONS.

(A) APPLICATION OF HYDRAULICS AND PNEUMATICS
(B) VENTING OF TANKS
(C) GIMBALING OF ENGINES

THE LAUNCH VEHICLE WILL BE ELECTRICALLY AND MECHANICALLY MATED ON THE ML, LOCATED AT PAD B. THE TEST WILL BE CONDUCTED IN TWO PARTS. ALL APPLICABLE SYSTEMS OF THE LAUNCH VEHICLE, GSE WILL BE PREPARED AND CONDITIONS FOR PREPARATIONS COMPLETE WILL BE ACHIEVED. THE AUTOMATIC SEQUENCE WILL GENERATE STIMULI TO THE GSE THROUGH COMMIT AND SIMULATED LIFTOFF. UMBILICAL EJECTION, HOLDDOWN ARM RELEASE, AND SERVICE ARM RETRACTION WILL BE SIMULATED IN THE ESE. IN PART I: PRIOR TO START OF TERMINAL COUNT SEQUENCE: THE DDP 224 DISPLAY COMPUTER WILL BE FAILED WITH SWITCHOVER TO ALTERNATE FIRING ROOM VERIFIED; A FORCE JUMP WILL BE INITIATED IN THE ML COMPUTER; AND AUTOMATIC RECOVERY WILL BE VERIFIED. ALSO THE 110A ML MEMORY DRUM WILL BE POWERED OFF.

DURING L/V PLUS TIME, THE LVDC LOCK OUT CAPABILITY WILL BE DEMONSTRATED DURING S-1B BOOST.

PART I WILL BE PERFORMED WITH THE LVDC IN FLIGHT MODE AND WILL BE TERMINATED AT TIME FOR START OF TIME BASE 2.

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
H	9/5/74	ASTP UPDATE	J. D. Owens 9/5/74	J. F. Bryan
G	12/3/73	UPDATE MSFC REQUIREMENTS	J. D. Owens 12/3/73	J. F. Bryan
F	7/11/73	EFFECTIVE THRU AS-209	J. D. Owens 7/11/73	J. F. Bryan
E	5/12/73	REMOVE SC SUPPORT	J. D. Owens 5/12/73	J. F. Bryan
D	5/15/73	AS-207 ONLY CHANGES	J. D. Owens 5/15/73	J. F. Bryan
C	2/9/73	ADD COMPUTER PROGRAMS	S/J.D. OWENS	S/F. BRYAN
B	11/3/72	UPDATE MSFC REQUIREMENTS	S/J.D. OWENS	S/F. BRYAN
A	8/16/72	ADD: M415 EXPERIMENT & MSFC REQUIREMENTS	S/J.D. OWENS	S/F. BRYAN

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
S/J. D. OWENS	S-8771, BATC	FEB. 2, 1972
10. NASA-KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
S/FRANK BRYAN	LV-ENG	2/14/72

KSC FORM 23-33AB (7/67)

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
SATURN 1B VEHICLE OPERATIONS FOR LAUNCH VEHICLE OVERALL TEST #1 (PLUGS IN)

2. KSC TEST NUMBER
V-20117

3. EFFECTIVITY
AS-207 AND SUBS

13. LOCATION
LC-39 PAD B

14. COMPUTER PROC. IDENTIFICATION CE10,DT02,EAPS,EAPF
FE50,FTB1,FT06,FT10,FT23,FT27,FT37,FT42,FT45

15. EST. TEST TIME
13 HOURS

16. SUPPORT REQUIREMENTS

GROUND POWER
S-IB STAGE POWER
S-IVB STAGE POWER
IU POWER
LCC DATA DISPLAY
BACKUP BATTERIES
OAT EQUIPMENT
LCC MEASURING (LVO)
GSE MEASURING (LVO)
DDAS

RD 25006

DDAS TAPE RECORDING
MOBILE SERVICE STRUCTURE MEASURING
RCA 110A COMPUTERS
LOCAL COMMAND CARRIER
TM RECORDS
ALDS
LCC TM STATION (MONITOR)
LCC TM RECORDING
DTS
DEE-6

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

18. ITEM CONTINUATION

ITEM 5 - TEST DESCRIPTION/EQUIPMENT STATUS/CONFIGURATION (CONT'D)

DURING RECYCLE TO PART II, THE GROUND COMPUTER SYSTEMS WILL BE RECOVERED. IN PART II, AFTER RECYCLE TO MINUS TIME, A COMPLETE FLIGHT MISSION WILL BE RUN. RANGE SAFETY COMMANDS WILL BE SENT TO CHECK THE RSCR SYSTEM.

ITEM 14 - COMPUTER PROC. IDENTIFICATION (CONT'D)

FT47,FT49,GE01,GT16,IAAR, IAFC,IALL,IAMC,IARS,IAPX,IATC,IATS,LAF2,LA01,LAPN, LZTU,NT98,NT99,OAPU,OAT1,EAIC,EASS

ITEM 5 - TEST DESCRIPTION (CONTINUED)
TEST REQUIREMENTS:

(LV)	TM-011-001-2H	1.5.1 thru 1.5.2 7.0.1, 7.0.2,
(IU)	7921601	NONE
(S-IB)	60C0650	3.5.3.1.5, 3.5.4.1
(S-IVB)	1B86721	NONE

KSC FORM 23-33BC (7/67)

70

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KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1 TEST TITLE
SATURN IB MOBILE LAUNCHER SLUG INSTALLATION

2 KSC TEST NUMBER
V-20118

3 EFFECTIVITY
AS-206 AND SUBS

4 TEST OBJECTIVES

TO REPLACE FUSES WITH SLUGS OR HIGHER RATED FUSES IN THE CRITICAL MOBILE LAUNCHER 9082 ELECTRICAL NETWORK DISTRIBUTOR, AND VISUALLY INSPECT REMAINING FUSES.

5 TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT CONTAIN HAZARDOUS OPERATIONS

SPECIFIED FUSES IN CIRCUITS DESIGNATED AS CRITICAL TO LAUNCH WILL BE REMOVED AND REPLACED WITH SLUGS OR HIGHER RATED FUSES TO PREVENT FUSE LINKS BREAKS RESULTING FROM VIBRATIONS DURING THE PERIOD FROM IGNITION THROUGH LIFTOFF. STAGE AND SYSTEM CONTRACTORS WILL BE RESPONSIBLE FOR THE DESIGNATION OF CIRCUIT FUSES. ALL REMAINING FUSES IN THE NETWORK DISTRIBUTORS WILL BE VISUALLY CHECKED FOR DAMAGE AND SECURE INSTALLATION.

TEST REQUIREMENTS:

NONE

6 REV.	DATE	REASON	Contractor Approval	KSC Approval
A	9/15/71	ASTP UPDATE	J. Fortenberry 9/15/71	F Bryan 9/22

7 CONTRACTOR APPROVAL	8 ORGANIZATION	9 DATE
J E Owens	5-8771	Oct. 18, 1971
10 NASA-KSC APPROVAL	**11 ORGANIZATION**	**12 APPROVAL DATE**
Frank Bryan WFC	LV-ENG	Oct 27, '71

KSC FORM 23-338B (7/67)

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

1 TEST TITLE
SATURN IB MOBILE LAUNCHER SLUG INSTALLATION

V-20118

AS-206 AND SUBS

13 LOCATION
MOBILE LAUNCHER

14 COMPUTER PASS VERIFICATION
N/A

16 SUPPORT REQUIREMENTS

17 OTHER APPLICABLE REFERENCE DOCUMENTATION

18 ITEM CONTINUATION

KSC FORM 23-338C (7/67)

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KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
SATURN IB BACKUP GUIDANCE SIMULATED FLIGHT TEST

2. KSC TEST NUMBER
V-20119

3. EFFECTIVITY
AS-207 AND SUBS

4. TEST OBJECTIVES
1. TO VERIFY PROPER SPACECRAFT AND LAUNCH VEHICLE GUIDANCE INTERFACE OPERATION.
2. TO VERIFY SPACECRAFT/LAUNCH VEHICLE GUIDANCE ELECTRICAL COMPATIBILITY AFTER A SIMULATED LV ATTITUDE REFERENCE FAILURE.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST [X] DOES [ ] DOES NOT CONTAIN HAZARDOUS OPERATIONS.

A. GIMBALLING OF ENGINES IS A HAZARDOUS CONDITION.

THE TEST WILL BE CONDUCTED IN THREE PARTS TO VERIFY THE FOLLOWING:

PART I - TILT AND ROLL SWITCHOVER CHARACTERISTICS - THE POLARITY OF TILT AND ROLL COMMANDS FROM THE S/C GUIDANCE TO THE S-IB ENGINE ACTUATORS, ALONG WITH THE SIGNAL CHARACTERISTICS OF S/C GUIDANCE COMMANDS AT SWITCHOVER, WITH BOTH LV AND S/C COMMANDS BEING NON-ZERO, ARE TO BE DEMONSTRATED IN A SINGLE RUN.

PART II - END TO END POLARITY TEST - THE POLARITY BETWEEN THE COUPLING DATA UNITS AND THE S-IB ENGINE ACTUATORS WILL BE DEMONSTRATED BY SIMULATED TORQUING OF THE IRIGS BY MEANS OF A SPECIAL K-START TEST PROGRAM.

PART III - SIMULATED FLIGHT
PLUS TIME SEQUENCE TEST OBJECTIVES - THE PURPOSE OF THIS TEST IS TO VERIFY THE BACKUP GUIDANCE COMPATIBILITY BETWEEN THE SPACECRAFT AND LAUNCH VEHICLE. IMMEDIATELY AFTER LIFTOFF AND DURING THE FIRST BOOST PHASE OF THE FLIGHT, A LAUNCH VEHICLE ATTITUDE REFERENCE FAILURE WILL BE SIMULATED. THE SINGLE SYSTEM FAILURE WILL BE SIMULATED PRIOR TO LVDC TIME-TILT PROFILE GENERATION AND IN SUFFICIENT TIME TO VERIFY PROGRAM LOCKOUTS OF ATTITUDE REFERENCE SWITCHOVER. DURING THE S-IB BURN MODE, S/C CONTROL WILL BE ENABLED, THE S/C CONTROL OF SATURN SWITCH WILL BE PLACED IN THE CMC POSITION, AND ROLL AND PITCH ERROR SIGNALS WILL BE GENERATED BY THE S/C GUIDANCE POLYNOMINAL. DUPING THE S-IVB BURN AND COAST MODES, MANUAL CONTROL OF SATURN WILL BE INITIATED AND HAND CONTROL CHECKS WILL BE PERFORMED. THE RESPONSE AND NON-RESPONSE OF THE LAUNCH VEHICLE TO MCC-H WILL BE VERIFIED, BOTH IN MINUS TIME AND DUPING THE SIMULATED FLIGHT.

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
C	11/5/4	ASTP UPDATE	J.D.Owens 11/5/4	F.Bryan 11/22
B	5/30/73	ADD HFLT PARTICIPATION	J.D.Owens 6/1/3	F.Bryan 6/4
A	1/31/73	ADD MSFC REQ, UPDATE COMPUTER PROG LIST	S/J.D.OWENS	S/F.BRYAN

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
S/J. D. OWENS	5-8771	SEPT. 2, 1971
10. NASA-KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
S/FRANK BRYAN	LV-ENG	2/14/72

KSC FORM 23-338B (12-67)

APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET 2

PAGE 2 OF 2

1. TEST TITLE
SATURN IB BACKUP GUIDANCE SIMULATED FLIGHT TEST

KSC TEST NUMBER
V-20119

EFFECTIVITY
AS-207 AND SUBS

13. LOCATION
LC-39

EQUIPMENT
EAIC,~~EAPF,EAPS,EASS,~~ FT06,FT10,FT20,FT23,FT42,FT49,FTB1,GT16,IAAR,

TIME
7 HOURS

16. SUPPORT REQUIREMENTS

GROUND POWER	DTS
S-IB STAGE POWER	LCC MEASURING (LVO)
S-IVB POWER	LCC DATA DISPLAY
IU POWER	DDAS
SM POWER	DDAS TAPE RECORDING
BACKUP BATTERIES	SERVICE STRUCTURE MEASURING
COUNTDOWN CLOCK	RCA 110A COMPUTERS
OAT EQUIPMENT	DEE-6
DEE-3	LCC TM STATION (MONITOR)
CM POWER	LCC TM RECORDING
GMIL	RD 26006
HFLT	

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

18. ITEM CONTINUATION

14. COMPUTER PROC. IDENTIFICATION (CONTINUED)

IAFC,IALL,IAMC,IAPX,IATC,IATS,LA01,LAF2,LAPW,NT98,NT99,OAPU,OAT1,CE10, FE50,FT27,FT37,GE01,LZTU,ZT96,FT55,FT47,FT45

5. TEST DESCRIPTION (CONTINUED)

TEST REQUIREMENTS:

(LV) TM-011-001-2H 1.1.1.2, 1.1.1.3, 1.1.1.4.1, 1.5.1 THRU 1.5.2, 7.0.1, 7.0.2

(IU) 7921601 0.3.5.2.5.3, 0.3.7.1.4

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KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

TEST TITLE: [illegible] IB LAUNCH VEHICLE OPERATIONS FOR FLIGHT READINESS TEST

TEST NUMBER: V-20120

EFFECTIVITY: AS-209 AND SUBS

TEST OBJECTIVES:
[illegible] IN A CONFIGURATION AS NEAR AS POSSIBLE TO LAUNCH CONFIGURATION, [illegible] PROPERLY WHEN OPERATED WITH ALL THE PAD GSE.

TEST DESCRIPTION:

THIS TEST [illegible] DOES NOT CONTAIN HAZARDOUS OPERATIONS.

HAZARDOUS OPERATIONS:

(A) APPLICATION OF [illegible] AND PNEUMATICS
(B) [illegible] OF TANKS
(C) [illegible] OF ENGINES

THE FLIGHT READINESS TEST WILL BE PERFORMED WITH THE SPACE VEHICLE IN LAUNCH CONFIGURATION EXCEPT FOR USE OF MINIMUM AMOUNT OF OAT EQUIPMENT REQUIRED FOR [illegible].

THE LAUNCH VEHICLE WILL COMPLETE A FULL DURATION MISSION SIMULATION. PROPELLANT LOADING WILL BE SIMULATED IN THIS TEST. UMBILICAL EJECTION, SERVICE ARM RETRACTION, [illegible] WILL BE SIMULATED. PROPELLANT MAST RETRACT [illegible] WILL [illegible], AND LAUNCH WATER VALVES OPERATED.

RADAR BEACON TRANSPONDER AND IU COMMAND RECEIVERS WILL BE INTERROGATED AND READ OUT BY RANGE OPERATIONS GROUND STATIONS.

[illegible] COMMANDS [illegible] AND RANGE SAFETY COMMANDS TO S-IB AND S-IVB WILL BE [illegible].

Contractor Approval	KSC Approval
[signature]	[signature]
[signature]	[signature]
[signature]	[signature]
[signature]	[signature]
[signature]	[signature]

REV. | DATE | REASON | Contractor Approval | KSC Approval

CONTRACTOR APPROVAL: [signature] | ORGANIZATION: S-1771 [illegible] | DATE: Feb 2, 1972

KSC APPROVAL: [signature] | ORGANIZATION: [illegible] | APPROVAL DATE: 2/14/72

KSC FORM [illegible]

APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET 2

PAGE 2 OF 2

TEST TITLE: SATURN IB LAUNCH VEHICLE OPERATIONS FOR FLIGHT READINESS TEST

TEST NUMBER: V-20120

EFFECTIVITY: AS-209 AND SUBS

LOCATION: LC-39 PAD B

COMPUTER PROCEDURE IDENTIFICATION: (SEE BLOCK 15)

TEST DURATION: 15 HOURS

SUPPORT REQUIREMENTS

GROUND POWER
S-IB STAGE POWER
S-IVB STAGE POWER
IU POWER
SM POWER
BACK-UP BATTERIES
COUNTDOWN CLOCK
OAT EQUIPMENT DEE-3 CM POWER
DTS
LCC MEASURING (LVO)
LCC DATA DISPLAY
DDAS

DDAS TAPE RECORDING
SERVICE STRUCTURE MEASURING
RCA 110A COMPUTERS
[illegible]
LCC TM STATION (MONITOR)
LCC TM RECORDING
USB STA [illegible]
CIF (DATA CORE MODULE #1)
RANGE RADAR (C-BAND)
RANGE COMMAND RADAR (IU CMD SYS)
RD 25001

OTHER APPLICABLE REFERENCE DOCUMENTATION

ITEMS CONTINUATION

14. COMPUTER PROC. IDENTIFICATION

BE02	EAPS	FT08	FT35	FU01	IALL	IZEA	LA01
BE03	EASS	FT10	FT37	GE01	IANC	IZRT	OAFC
BT01	FL50	FT20	FT45	GT16	IAPA	IZSA	OAT1
EADS	FTB1	FT23	FT47	IAAR	IARS	IZ33	NTAS
EAIC	FT04	FT27	FT49	IAED	IATC	LAPA	NT99
EAPF	FT06	FT33	FT55	IAFC	IATS	LAF2	ZT96

5. TEST DESCRIPTION (CONTINUED)

TEST REQUIREMENTS

LV	TM-011-001-2H	1.1.1.2, 1.1.1.3, 1.4.1.1, 1.4.1.2, 1.5.1 THRU 1.5.2.2 2.0.1.1, 2.0.1.2, 2.0.1.3, 2.0.1.4, 1.1.1.4.1, 1.5.1, 2.0.1.5, 2.0.1.6, 7.0.1, 7.0.2,
IU	7921601	0.3.4.2.3.2, 0.3.7.1.3, 0.3.5.2.2.3.1, 0.3.5.2.2.3.1 0.3.4.0.1
S-IVB	1B86721	NONE
S-IB	60C06050	NONE

KSC FORM [illegible]

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KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
LV COUNTDOWN SIMULATION

2. KSC TEST NUMBER
V-20126

3. EFFECTIVITY
SIMULATOR

4. TEST OBJECTIVES

TO VERIFY/MAINTAIN LV FIRING ROOM CREW PROFICIENCY.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT CONTAIN HAZARDOUS OPERATIONS.

THIS TEST WILL SIMULATE IN THE LCC THE TERMINAL PORTION OF THE LV COUNTDOWN. THE LCC FUNCTIONS WILL BE DYNAMICALLY SIMULATED BY USE OF THE LV SIMULATOR.

ONLY THE LCC FACILITIES ARE REQUIRED. ML, LV, AND PAD SYSTEMS ARE NOT REQUIRED.

THE FIRING ROOM AND COMPUTER COMPLEX WILL BE CONNECTED TO THE LV SIMULATOR.

TEST REQUIREMENTS:

NONE

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
B	9/5/74	ASTP DATA	R E Clemens 9/5/74	[illegible]
A	3/17/74	PROGRAMS FOR LVOS	R E Clemens 3/19/74	[illegible]

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
R E Clemens	5-8771	Sept 18, 1972
10. NASA-KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
R E Clemens	LV-OMO3	Sept 27, 1972

KSC FORM 23-378 (7-67)

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
LV COUNTDOWN SIMULATION

2. KSC TEST NUMBER
V-20126

3. EFFECTIVITY
SIMULATOR

12. LOCATION
LC-39

14. COMPUTER PROC. IDENTIFICATION
(SEE ITEM 18 BELOW)

15. EST. TEST TIME
4 HOURS

15. SUPPORT REQUIREMENTS

XDS-930 COMPUTER (601 AND 604)
LCC-RCA 110A COMPUTER
LAB-RCA 110A COMPUTER
COUNT CLOCK
COUNT CLOCK DISPLAYS
DDAS
OIS
OTV SIMULATION

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

18. ITEM CONTINUATION

14. COMPUTER PROC. IDENTIFICATION

BE02	EADS	FT42	IALK	OATO
BE03	FE50	FT43	IAMC	OASB
BT01	FTB1	FT45	IAPX	ZT96
CE10	FT03	FT47	IARS	
CTB1	FT05	FT49	IASC	
CTB2	FT06	FT55	IASL	
CTB7	FT10	GE01	IATC	
CTC3	FT20	GT16	IATS	
CTC4	FT23	IAAR	LAPW	
CTC5	FT31	IAED	LZT4	
	FT37	IAFC	OALB	
		IALL	OALS	
			OAPU	

KSC FORM 23-378C (7-67)

14

REV 32

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
SATURN S-IB RP-1 LOADING OPERATIONS

2. KSC TEST NUMBER
V-20127

3. EFFECTIVITY
AS-206 AND SUBS

4. TEST OBJECTIVES

TO TRANSFER RP-1 TO THE S-IB STAGE.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST XX DOES ☐ DOES NOT CONTAIN HAZARDOUS OPERATIONS.

HAZARDS INVOLVE FLAMMABLE FUEL HANDLING.

ALL VEHICLE AND ACTIVE GSE SYSTEMS INVOLVED IN RP-1 LOADING MUST BE IN LOADING CONFIGURATION AND READINESS.

AN OIS VERIFICATION WILL BE MADE THAT ALL ASSOCIATED SYSTEMS AND ORGANIZATIONS ARE READY TO SUPPORT THE OPERATION.

THE S-IB STAGE FUEL TANK WILL BE LOADED TO A LEVEL CONSISTENT WITH STAGE REQUIREMENTS.

TEST REQUIREMENTS

(S-IB) 6DC06050 3.3.0.1, 3.5.2.5.2, 3.5.2.6.2

(MSFC) TM-011-001-2H 11.0.2, 11.0.3, 12.0.1

6 REV.	DATE	REASON	Contractor Approval	KSC Approval
D	9/5/74	ASTP UPDATE	[illegible] 9/5/74	[illegible] 9/12/74
C	11/30/73	REVISE TEST REQUIREMENTS	[illegible] 12/3/73	[illegible] 12/5/73
B	10/26/72	ADD RD, ADD GSE-3 & DTS; ADD COMP. PROG., AND TEST REQUIREMENTS	[illegible] 10/24/72	[illegible] 11/1
A	8/10/72	TO ADD TEST REQUIREMENTS	8/11/72 S/L.P.CORBRIDGE	8/15/72 S/F.BRYAN

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
S/J. D. OWENS	5-8771 THE BOEING COMPANY	APRIL 17, 1972
10. NASA-KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
S/FRANK BRYAN	LV-ENG	5/19/72

KSC FORM 23-23RB (7-67)

APOLLO-SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
SATURN S-IB RP-1 LOADING OPERATIONS

2. KSC TEST NUMBER
V-20127

3. EFFECTIVITY
AS-206 AND SUBS

13. LOCATION
LC-39 PAD B

14. COMPUTER PROG. IDENTIFICATION
BE01,BE02,BT01

15. EST. TEST TIME
TBD

16. SUPPORT REQUIREMENTS

RD 26230
KSC PAD SAFETY
SECURITY POLICE
FIRE FIGHTING
DDAS TAPE RECORDING
DDAS RCA-110A
F&E MEASUREMENTS
FACILITY COMM. (OIS)
OTV
SURVEILLANCE CAMERAS
GROUND POWER
S-IB STAGE POWER
HP GAS
DEE-3
DTS (PROPELLANTS)

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

18. ITEM CONTINUATION

KSC FORM 23-23RC (7-67)

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REV 32

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE

SATURN S-IB RP-1 REPLENISH & LEVEL ADJUST OPERATIONS

2. KSC TEST NUMBER
V-20128

3. EFFECTIVITY
AS-206 AND SUBS

4. TEST OBJECTIVES

TO PERFORM RP-1 REPLENISH AND LEVEL ADJUST OPERATIONS TO SUPPORT CDDT AND LAUNCH COUNTDOWN.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST XX DOES ☐ DOES NOT CONTAIN HAZARDOUS OPERATIONS.

HAZARDS INVOLVE FLAMMABLE FUEL HANDLING.

ALL VEHICLE AND ACTIVE GSE SYSTEMS INVOLVED IN RP-1 LOADING MUST BE IN LOADING CONFIGURATION AND READINESS.

AN OIS VERIFICATION WILL BE MADE THAT ALL ASSOCIATED SYSTEMS AND ORGANIZATIONS ARE READY TO SUPPORT THE OPERATION.

THE REPLENISH SEQUENCE IS USED TO INSURE A SUFFICIENT QUANTITY OF RP-1 TO PERFORM AN ACCURATE LEVEL ADJUST DRAIN.

THE LEVEL ADJUST SEQUENCE IS USED TO GRAVITY DRAIN THE S-IB STAGE UNTIL 100% FLIGHT MASS IS INDICATED ON THE S-IB RP-1 TANKING COMPUTER PANEL.

TEST REQUIREMENTS:

(S-IB) 60C06050 3.3.0.1

(LV) TM-011-001-2H 12.0.1

6. REV	DATE	REASON	Contractor Approval	KSC Approval
D	12/5/74	ASTP UPDATE	12/5/74	12/22/74
C	11/30/73	ADD LV TEST REQUIREMENTS	12/3/73	12/3/73
B	10/25/72	ADD COMP. PROG, CHANGE TO SUBTASK, ADD RD, ADD DEE-3 & DTS	10/26/72	10/31/72
A	8/10/72	TO ADD TEST REQUIREMENTS	8/11/72 S/L. R. COBRIDGE	8/15/72 S/F. BRYAN

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
S/L. D. CHENS	S-8771 THE BOEING COMPANY	APRIL 17, 1972
10. NASA-KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
S/FRANK BRYAN	LV-ENG	5/19/72

KSC FORM 28-338B (7-67)

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE

SATURN S-IB RP-1 REPLENISH & LEVEL ADJUST OPERATIONS

2. KSC TEST NUMBER
V-20128

3. EFFECTIVITY
AS-206 AND SUBS

13. LOCATION
LC-39 PAD B

14. COMPUTER PROG. IDENTIFICATION
BE02, BE03

15. EST. TEST TIME

16. SUPPORT REQUIREMENTS

RD 26231
KSC PAD SAFETY
SECURITY POLICE
FIRE FIGHTING
DDAS TAPE RECORDING
DDAS RCA-110A
F&E MEASUREMENTS
FACILITY COMM. (OIS)
OTV
SURVEILLANCE CAMERAS
GROUND POWER
S-IB STAGE POWER
HP GAS
DEE-3
DTS (PROPELLANTS)

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

18. ITEM CONTINUATION

KSC FORM 28-338C (7-67)

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KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
SATURN S-IB RP-1 DRAIN OPERATIONS

2. KSC TEST NUMBER
V-20129

3. EFFECTIVITY
AS-206 AND SUBS

4. TEST OBJECTIVES

TO PRESSURE DRAIN RP-1 FROM THE S-IB STAGE.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST [X] DOES [ ] DOES NOT CONTAIN HAZARDOUS OPERATIONS.

HAZARDS INVOLVE FLAMMABLE FUEL HANDLING.

ALL VEHICLE AND ACTIVE GSE SYSTEMS INVOLVED IN RP-1 DRAIN MUST BE IN DRAIN CONFIGURATION AND READINESS.

AN OIS VERIFICATION WILL BE MADE THAT ALL ASSOCIATED SYSTEMS AND ORGANIZATIONS ARE READY TO SUPPORT THE OPERATION.

THE S-IB RP-1 DRAIN SEQUENCE WILL BE PERFORMED FOR EMERGENCIES AND SPECIAL TESTS ONLY. THE DRAIN SEQUENCE WILL BE A PRESSURE DRAIN USING FLIGHT PRESSURE IN THE FUEL TANKS ALLOWING THE FUEL TO DRAIN BACK TO THE STORAGE TANKS.

FOLLOWING THE STAGE DRAIN THE TRANSFER LINE WILL BE EMPTIED OF RESIDUAL RP-1.

TEST REQUIREMENTS:

NONE

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
B	9/5/74	ASTP UPDATE	9/5/74	9/22
A	10/26/72	ADD COMP. PROG., ADD RD, ADD DEE-3 & DTS	10/26/72	11/1

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
S/J. D. OWENS	S-8771 THE BOEING COMPANY	APRIL 17, 1972
10. NASA/KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
S/FRANK BRYAN	LV-ENG	5/19/72

KSC FORM 23.338B (7-67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
SATURN S-IB RP-1 DRAIN OPERATIONS

2. KSC TEST NUMBER
V-20129

3. EFFECTIVITY
AS-206 AND SUBS

12. LOCATION
LC-39 PAD B

14. COMPUTER PROG. IDENTIFICATION
BE02,BT01

15. EST. TEST TIME
TBD

16. SUPPORT REQUIREMENTS

RD 26232
KSC PAD SAFETY
SECURITY POLICE
FIRE FIGHTING
DDAS TAPE RECORDING
DDAS RCA-110A
F&E MEASUREMENTS
FACILITY COMM. (OIS)
OTV
SURVEILLANCE CAMERAS
GROUND POWER
S-IB STAGE POWER
HP GAS
DEE-3
DTS (PROPELLANTS)

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

18. ITEM CONTINUATION

KSC FORM 23.338C (7-67)

7.7

REV 32

KSC OPERATIONS
APOLLO-SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 4

1. TEST TITLE
SATURN 1B LAUNCH VEHICLE OPERATIONS IN SUPPORT OF SPACE VEHICLE COUNTDOWN DEMONSTRATION TEST AND LAUNCH COUNTDOWN

2. KSC TEST NUMBER
V-20130

3. EFFECTIVITY
AS-209 AND SUBS

4. TEST OBJECTIVES

1. TO DEMONSTRATE, IN CONJUNCTION WITH APOLLO SPACECRAFT OPERATIONS, THE TIME PHASING OF THE SEQUENCES NECESSARY TO PREPARE THE LAUNCH VEHICLE FOR LAUNCH.
2. TO DEMONSTRATE THE TIME PHASING OF COMPUTERIZED TEST AND CHECKOUT PROGRAMS REQUIRED TO PREPARE THE LAUNCH VEHICLE FOR LAUNCH.
3. TO VERIFY THAT THE LAUNCH VEHICLE AND THE GROUND SUPPORT EQUIPMENT ARE IN A STATUS TO SUPPORT LAUNCH COUNTDOWN.

(CONTINUED ON PAGE 2, SECTION 18)

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST X DOES ☐ DOES NOT CONTAIN HAZARDOUS OPERATIONS.

CDDT & CD OPERATIONS ARE CONSIDERED HAZARDOUS FOR THE FOLLOWING REASONS:

1. RP-1 WILL BE ON BOARD
2. PROPELLANT TANKS AND GAS STORAGE SPHERES WILL BE PRESSURIZED.
3. HAZARDOUS ENVIRONMENTAL CONDITIONS MAY BE ENCOUNTERED.
4. CRYOGENIC LIQUIDS WILL BE LOADED.
5. HEAVY EQUIPMENT MOVEMENTS WILL BE REQUIRED.
6. THE FLIGHT CREW WILL INGRESS AND THE HATCH WILL BE CLOSED.
7. LIVE ORDNANCE WILL BE INSTALLED AND CONNECTED.
8. ENGINE IGNITION WILL OCCUR.

CONFIGURATION:

THE LAUNCH VEHICLE MUST BE ON THE PAD WITH ALL PREREQUISITE TESTS COMPLETED.

TEST DESCRIPTION: (SEE PAGE 2, SECTION 18)

TEST REQUIREMENTS (SEE PAGE 3)

REV.	DATE	REASON	Contractor Approval	KSC Approval
H	9/5/74	ASTP UPDATE	J.R. Bennett 9/5/74	E. Bryan 9/22/74
G	12/20/73	TEST REQUIREMENTS	J.R. Bennett 12/17/73	E. Bryan 12/19/73

7. CONTRACTOR APPROVAL: C/J.D. OWENS
8. ORGANIZATION: S-8771
9. DATE: FEB. 22, 1972
10. NASA-KSC APPROVAL: S/FRANK BRYAN
11. ORGANIZATION: LV-ENG
12. APPROVAL DATE: FEB. 29, 1972

KSC FORM 23-336B (7/67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 4

1. TEST TITLE
SATURN 1B LAUNCH VEHICLE OPERATIONS IN SUPPORT OF SPACE VEHICLE COUNTDOWN DEMONSTATION TEST AND LAUNCH COUNTDOWN

2. KSC TEST NUMBER
V-20130

3. EFFECTIVITY
AS-209 AND SUBS

13. LOCATION
LC-39B

14. COMPUTER PROG IDENTIFICATION
SEE PAGE 3

15. EST TEST TIME
4 DAYS PLUS HOLDS

16. SUPPORT REQUIREMENTS

SD/RD 25000	PROPELLANTS DC POWER
GROUND POWER	PTCS (ALL SYSTEMS)
S-1B STAGE POWER	DTS
S-IVB STAGE POWER	DEE-3
IU STAGE POWER	DEE-6
ETR RANGE SAFETY	110A COMPUTERS
KSC PAD SAFETY	CM W-G ECS
SECURITY POLICE	CCF
FIRE FIGHTING	CIF
MEDICAL	SEARCHLIGHTS
	TCE

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

S/V PROCEDURE 40400	ETR OD 25000	S/V SCRUB TURNAROUND 40400
LMRD K-1B-02.10	S/C PROCEDURE K0007	

18. ITEM CONTINUATION

TEST OBJECTIVES (CONTINUED FROM PAGE 1, SECTION 4)

4. TO PROVIDE THE CAPABILITY TO SAFE AND DRAIN THE LAUNCH VEHICLE IF NECESSARY.
5. TO PREPARE THE LAUNCH VEHILCE FOR LAUNCH
6. TO LAUNCH THE SPACE VEHICLE

TEST DESCRIPTION (CONTINUED FROM PAGE 1, SECTION 5)

A. THE TOTAL PROCEDURE IS DIVIDED INTO THREE VOLUMES AS FOLLOWS:

1. VOLUME I WILL INCLUDE TANK AND FACILITY PURGES, ORDNANCE INSTALLATION AND CONNECTION, DIGITAL RANGE SAFETY COMMAND SYSTEM TESTS AND SERVICE ARM PRESSURIZATION.

2. VOLUME II WILL INCLUDE FLIGHT BATTERY INSTALLATION, ACCESS KIT REMOVAL, LAUNCH VEHICLE FINAL CLOSEOUT OPERATIONS, MSS TRANSFER OPERATIONS, CRYOGENIC PROPELLANT LOADING, AND THE TERMINAL COUNT SEQUENCE. APPENDICES WILL INCLUDE SAFING PROCEDURES, DRAIN OPERATIONS, CONTINGENCY PROCEDURES AND RECYCLE OPERATIONS.

3. VOLUME III WILL INCLUDE GUIDELINES FOR EVALUATION OF ANOMALIES WHICH MIGHT OCCUR DURING THE TERMINAL COUNT SEQUENCE (TCS). THIS VOLUME CONTAINS A DESCRIPTION, FOR EACH TCS SEQUENCE, OF THE POTENTIAL SIGNIFICANCE OF THE ANOMALY, THE STATION(S) RESPONSIBLE FOR ACTION, THE ACTION TO BE TAKEN AND THE RATIONALE FOR THE PRESCRIBED ACTION.

KSC FORM 23-336C (7/67)

1. TEST TITLE
SATURN IB LAUNCH VEHICLE OPERATIONS IN SUPPORT OF SPACE VEHICLE COUNTDOWN DEMONSTRATION TEST AND LAUNCH COUNTDOWN

2. KSC TEST NUMBER
V-20130

3. EFFECTIVITY
AS-209 AND SUBS

ITEM CONTINUATION

TEST DESCRIPTION (CONTINUED)

B. TEST COMPARISONS

IF A COUNTDOWN DEMONSTRATION TEST IS PERFORMED, THE SEQUENCE OF OPERATIONS WILL BE THE SAME AS THE LAUNCH COUNTDOWN WITH THE FOLLOWING MAJOR EXCEPTIONS: LAUNCH VEHICLE BATTERIES WILL NOT BE INSTALLED; PROPELLANT DISPERSION DETONATORS, PRIMACORD, HOLDDOWN ARM ORDNANCE AND SOLID PROPELLANT GAS GENERATOR INITIATORS WILL NOT BE CONNECTED; THE FLIGHT CREW WILL NOT INGRESS THE SPACECRAFT; AND THE TERMINAL COUNT SEQUENCE WILL BE INTERRUPTED AT TIME FOR S-IB ENGINE IGNITION. FOR LAUNCH COUNTDOWN THE TERMINAL COUNT WILL RESULT IN LAUNCH OF THE SPACE VEHICLE. OPERATIONS TO SECURE GROUND SUPPORT EQUIPMENT AFTER LAUNCH WILL BE INCLUDED.

COMPUTER PROGRAM IDENTIFICATION (CONTINUED FROM PAGE 2, SECTION 14)

BE02	CT87	EA55	FT03	FT20	FT37	FT55	IAAR	IALL	IATC	IZ33	NT98
BE03	CT03	EA05	FT04	FT23	FT42	GE01	IAED	IAMC	IATS	LAF2	NT99
BT01	CT04	EAP5	FT05	FT25	FT43	GT16	IAES	IAPX	IZEA	LAPW	OALB
CTB1	CT05	EAPU	FT06	FT31	FT45		IAFC	IARS	IZRE	LA01	OALS
CTB2	EA1C	FE50	FT10	FT33	FT47		IALJ	IASL	IZSA	LZTU	OAPU
CE10		FTB1	FT08	FT35	FT49			IASP		MT01	OATO
											ZT96

KSC FORM 28-336D (7-67)

1. TEST TITLE
SATURN IB LAUNCH VEHICLE OPERATIONS IN SUPPORT OF SPACE VEHICLE COUNTDOWN DEMONSTRATION TEST AND LAUNCH COUNTDOWN

2. KSC TEST NUMBER
V-20130

3. EFFECTIVITY
AS-209 AND SUBS

ITEM CONTINUATION

TEST REQUIREMENTS: (CONTINUED FROM PAGE 1, SECTION 5)

(S-IB)	60C06050	3.2.1.1	3.3.2.4.1	3.6.1.1.1	3.6.1.4	3.6.4.2
		3.2.1.2	3.3.2.4.2	3.6.1.1.2	3.6.2.1	3.7.2.21.4
		3.2.2.3	3.5.2.3.2	3.6.1.2	3.6.2.2	3.6.2.3
		3.2.5.3.6	3.5.2.3.3	3.6.1.3.1	3.6.4.1	
				3.6.1.3.2		
		0.2.5.1.2.0	0.2.5.4.1.2			
		0.2.5.4.1.1	0.2.5.4.1.3	0.2.5.4.1.4.1.1		
(S-IVB)	1B86721	0.2.5.2.3.1	0.2.5.2.3.2			0.2.5.4.3.0(ALL)
(IU)	7921601	0.3.4.1.1.1.1	0.3.4.1.1.1.2	0.3.5.2.1.3.1	0.3.5.2.7	
		0.3.5.2.8	0.3.5.3.1.2	0.3.5.3.2	0.3.5.3.4	
		0.3.5.2.5.2	0.3.2.1.1			
(LV)	TM-011-001-2H	1.1.1.3	1.4.1.2	3.0.1	10.0.1.4	
		1.1.1.4.1	1.4.2	4.0.1	11.0.4	
		1.2.1 (ALL)		9.0.1.3	13.0.1	
		1.2.3.1	1.7.1.1	9.0.1.4	14.0.3.1	
		1.2.3.2	1.7.1.2	10.0.1	14.0.4.1.1	
		1.2.3.4	1.8.1	10.0.1.1	14.0.4.2	
		1.2.3.3	1.8.2	10.0.1.2	14.0.4.3	
		1.2.2		10.0.1.3		
			1.5.1 THRU 1.5.1.2.2			

KSC FORM 28-336D (7/67)

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KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
SATURN S-IB VEHICLE LOX/LH2 TANKS AND FACILITY LH2 SYSTEM PURGE.

2. KSC TEST NUMBER
V-20131

3. EFFECTIVITY
AS-206 AND SUBS

4. TEST OBJECTIVES

VOLUME I - TO PURGE THE S-IVB LOX AND LH2 TANKS, S-IVB ENGINE FUEL DUCT, S-IVB GSE HEAT EXCHANGER AND FACILITY LH2 SYSTEM PRIOR TO CRYOGENIC LOADING OF STAGES.

VOLUME II - TO PURGE THE VEHICLE AND GROUND SYSTEMS OF LH2 FOLLOWING VEHICLE CRYOGENIC DRAIN AND INERT THE GROUND SYSTEMS FOLLOWING LAUNCH.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST [X] DOES [ ] DOES NOT CONTAIN HAZARDOUS OPERATIONS.

VOLUME I HAZARDS INCLUDE HIGH PRESSURE AND INERT ATMOSPHERE.

VOLUME II HAZARDS INCLUDE HIGH PRESSURE, GH2 ATMOSPHERE, AND INERT ATMOSPHERE.

VOLUME I

AFTER TEST PREPARATIONS, A HELIUM PURGE OF THE S-IVB LOX TANK AND SYSTEMS WILL BE PERFORMED. THE STAGE LOX TANK SHALL BE CONSIDERED PURGED WHEN A MOISTURE CONTENT LESS THAN 200 PPM IN THE S-IVB STAGE IS ACHIEVED WITH A CONTAMINATION LESS THAN 1% BY VOLUME. SUBSEQUENT TO THE STAGE LOX TANK PURGE, A SYSTEMATIC HELIUM PURGING OF THE S-IVB STAGE LH2 TANK AND SYSTEMS WILL BE ACCOMPLISHED. AFTER A VERIFICATION OF 93% HELIUM, AND LESS THAN 200 PPM MOISTURE CONTENT IN THE S-IVB STAGE LH2 TANK, THE FACILITY LH2 SYSTEM, S-IVB STAGE HEAT EXCHANGER AND THE STAGE/FACILITIES ACCESSORIES SHALL BE PURGED WITH GHE AND VERIFIED TO CONTAIN 0% OXYGEN AND THE LH2 TRANSFER LINES VERIFIED TO CONTAIN 99.9% GHE AND A DEW POINT OF -65° OR LESS.

FOLLOWING THE PURGE, ALL SYSTEMS SHALL BE PLACED IN A STANDBY CONFIGURATION WITH HELIUM IN ALL SYSTEMS. AFTER A MINIMUM OF 8 HOURS FOLLOWING COMPLETION OF LH2 FACILITY PURGES, REPEATED DEW POINT READINGS SHALL BE TAKEN TO INSURE THE SYSTEMS ARE WITHIN SPECIFICATIONS.

VOLUME I
TEST REQUIREMENTS:

NONE

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
C	R/C/4	ASTP UPDATE		
B	2/15/73	REVISE PD NUMBER		
A	12/4/72	ADD PD NO. ADD S-IV B GSE HEAT EXCHANGER & S-IVB SKID.		

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
S/J. D. OWENS	S-8771	JULY 6, 1972
10. NASA KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
S/FRANK BRYAN	LV-ENG	JULY 20, 1972

KSC FORM 23-336B (7/67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
SATURN S-IB VEHICLE LOX/LH2 TANKS AND FACILITY LH2 SYSTEM PURGE.

2. KSC TEST NUMBER
V-20131

3. EFFECTIVITY
AS-206 AND SUBS

13. LOCATION
LC-39

14. COMPUTER PROG. IDENTIFICATION
N/A

15. EST. TEST TIME
17 HOURS

16. SUPPORT REQUIREMENTS

VOLUME I	VOLUME II
SID-20131-B	SID-20131-B
PROPELLANT NETWORKS	PAD OIS
S-IVB GSE	FACILITY LH2 SUPPLY SYSTEM SUPPORT
GROUND POWER	H.P. GHE & GN2
S-IVB STAGE POWER	S-IVB GROUND & STAGE PNEUMATICS
DDAS	RCA 110A COMPUTERS
RCA 110A COMPUTERS	DDAS
KSC PAD SAFETY	KSC PAD SAFETY

17. OTHER APPLICABLE REFERENCE DOCUMENTATION
VOL. I - N/A
VOLUME II - N/A

18. ITEM CONTINUATION ITEM 5. (CONTINUED)

VOLUME II

AFTER VEHICLE LH2 & LOX ARE DRAINED, THE VEHICLE LH2 & GROUND LH2 SYSTEMS WILL BE PURGED WITH GHE. SAMPLES WILL BE TAKEN AS PURGE IS CONTINUED. PAD SAFETY WALK THRU WILL ASSURE THAT LESS THAN 4% GH2 AT THE S-IVB SKID LEVEL IS ACHIEVED BEFORE PAD OPENING. WHEN LESS THAN 4% GH2 IS ACHIEVED, ALL SYSTEMS MAY BE SECURED.

VOLUME II
TEST REQUIREMENTS:

NONE

KSC FORM 23-336C (7/67)

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KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
SATURN IB LAUNCH VEHICLE AUTOMATIC AND MANUAL LOX/LH2 LOADING AND DRAIN OPERATIONS

2. KSC TEST NUMBER
V-20132

3. EFFECTIVITY
AS-207 & SUBS

4. TEST OBJECTIVES

TO FILL THE S-IB STAGE WITH LIQUID OXYGEN AND THE S-IVB STAGE WITH LIQUID OXYGEN AND LIQUID HYDROGEN TO THE REQUIRED FLIGHT MASS FOR THE SATURN IB LAUNCH VEHICLE.

TO DRAIN THE LAUNCH VEHICLE LOX AND LH2 TANKS WHEN SUPPORTING CDDT OR A LAUNCH ABORT AND SCRUB.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST ☒ DOES ☐ DOES NOT CONTAIN HAZARDOUS OPERATIONS.

HAZARDS INCLUDE:

A. CRYOGENIC PROPELLANTS
B. PROPELLANT SYSTEMS PRESSURES
C. INERT ATMOSPHERES

LV TANKING

THIS TEST WILL BE PERFORMED AS A SUBTASK TO LV COUNTDOWN AND CDDT AFTER ALL PROPELLANT LOADING PREREQUISITES HAVE BEEN COMPLETED. ALL VEHICLE AND ACTIVE GSE SYSTEMS INVOLVED IN PROPELLANT LOADING MUST BE IN LAUNCH DAY CONFIGURATION AND READINESS.

THIS PROCEDURE PROVIDES THE STEPS REQUIRED FOR BOTH AUTOMATIC LOADING VIA THE PROPELLANT LOADING COMPUTER SYSTEM, OR VIA MANUAL OPERATIONS IN THE EVENT OF A SYSTEM FAILURE.

PROPELLANT LOADING WILL BE INITIATED WITH LOX STORAGE TANK PRESSURIZATION AND LOX TRANSFER SYSTEM CHILLDOWN. THE S-IB IS LOADED FIRST BY SLOW FILL, FAST FILL, THEN SLOW FILL RATES TO 99% MASS. THE S-IVB IS THEN LOADED BY SLOW FILL, FAST FILL, THEN SLOW FILL RATES TO 99% MASS. NORMAL REPLENISH BRINGS THE STAGES UP TO, AND MAINTAINS, 100% MASS LEVELS.

THE LH2 STORAGE TANK IS THEN PRESSURIZED AND THE LH2 TRANSFER SYSTEM CHILLED DOWN. AT S-IVB LOX 25%, THE S-IVB IS LOADED BY SLOW FILL, FAST FILL, THEN SLOW FILL RATES TO 100% MASS, THEN REPLENISH IS ENABLED TO MAINTAIN THAT LEVEL. LOX AND LH2 REPLENISH TERMINATES AT THE START OF THE TERMINAL COUNT SEQUENCE.

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
D	10/30/73	CHANGE MSFC TEST REQTS		
C	6/15/73	EARLY START S-IVB LH2 CHILLDOWN	3/26/73	
B	3/27/73	REVISE TEST REQUIREMENTS		
A	12/15	ADD RD & TEST REQUIREMENTS	2/18/72	12/13

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
J D Owens	5-8771	Feb. 2, 1972
10. NASA-KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
Frank Arpa	LV-ENG	3/14/72

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APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET 2 OF 2

1. TEST TITLE
SATURN IB LAUNCH VEHICLE AUTOMATIC AND MANUAL LOX/LH2 LOADING AND DRAIN OPERATIONS

V-20132
AS-207 & SUBS

3. LOCATION
LC-39 PAD B

8 HOURS

10. SUPPORT REQUIREMENTS

GROUND POWER	PROPELLANT UTILIZATION SYSTEM
S-IB STAGE POWER	LSE/GSE
S-IVB STAGE POWER	TM
BACKUP BATTERIES	LCC MEASURING (LVO)
SEARCH LIGHTS	GSE MEASURING (LVO)
KSC PAD SAFETY	LCC DATA DISPLAY
SECURITY POLICE	DDAS
FIRE FIGHTING	RCA 110A COMPUTERS
F&E MEASUREMENTS	RD 26032
IU STAGE POWER	

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

18. ITEM CONTINUATION ITEM 5. (CONTINUED)

LV DRAIN

AFTER PREPARATIONS ARE COMPLETED, DRAIN IS INITIATED BY S-IVB LH2 TANK PRESSURIZATION, LH2 STORAGE TANK VENTING, AND OPENING THE S-IVB LH2 FILL AND DRAIN VALVE. WHEN LH2 DRAIN IS COMPLETE, THE STAGE VALVE IS CLOSED AND A SHORT PURGE EMPTIES THE LINES BACK TO THE STORAGE TANK. WHEN LH2 DRAIN IS COMPLETE, LOX DRAIN IS INITIATED BY LOX STORAGE TANK VENTING AND S-IB AND S-IVB LOX TANKS PRESSURIZATION. THE S-IVB IS DRAINED FIRST, THEN THE S-IB. PROPELLANT DRAIN IS COMPLETE AND TANK PURGING INITIATED AT APPROXIMATELY T+2 HOURS 50 MINUTES.

TEST REQUIREMENTS:

(LV) TM-011-001-2H	11.0.1, 12.0.1
(S-IB) 60C06050	3.3.0.1
(S-IVB) 1B86721	0.2.5.4.6.0 ALL
	0.2.5.4.7.1
	0.2.5.4.7.2

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KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE

SATURN IB LAUNCH VEHICLE EMERGENCY PROCEDURE

2. KSC TEST NUMBER
V-20133

3. EFFECTIVITY
AS-206 AND SUBS

4. TEST OBJECTIVES

TO PROVIDE THE REQUIRED CORRECTIVE ACTIONS TO BE TAKEN FOR SPECIFIC EMERGENCY SITUATIONS TO PREVENT SERIOUS INJURY TO PERSONNEL OR SIGNIFICANT DAMAGE TO HARDWARE.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST [X] DOES [ ] DOES NOT CONTAIN HAZARDOUS OPERATIONS.

THIS TCP CONTAINS PROCEDURES FOR SPECIFIC EMERGENCY SITUATIONS. PROCEDURAL CONTENT IS SHOWN ON THE TEST OUTLINE AND IN THE TABLE OF CONTENTS. USE OF THIS TCP IS DESCRIBED IN THE INTRODUCTION SECTION.

THE EMERGENCY PROCEDURES IN THIS TCP INTEGRATE LAUNCH VEHICLE TEST CREW ACTIVITY BY CALLING OUT SUBTASKS (BY TCP REFERENCE) TO BE ACCOMPLISHED IN TOTAL OR IN PART, AND BY CALLING OUT SPECIFIC CONSOLE-LEVEL ACTIONS WHERE APPROPRIATE. REQUIRED ACTIONS ARE PROCEDURALIZED ONLY TO THE LEVEL REQUIRED TO INTEGRATE OVERALL ACTIVITIES. IN GENERAL, THE EMERGENCY STEPS COVER ONLY ACTIONS REQUIRED TO BRING THE SITUATION TO A SAFE STATIC CONDITION. REAL TIME ASSESSMENTS AND DECISIONS WILL THEN BE MADE TO RETURN TO NORMAL OPERATIONS.

TEST REQUIREMENTS:

NONE

6 REV.	DATE	REASON	Contractor Approval	KSC Approval
A	9/1/71	MSTP UPDATE	J. Bowers 9/15/71	F. Bryan 9/22

7 CONTRACTOR APPROVAL	8 ORGANIZATION	9 DATE
J. Bowers	5-8571	August 25, 1971
10 KSC APPROVAL	**11 ORGANIZATION**	**12 APPROVAL DATE**
Frank Bryan	LV-ENG	9/13/71

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APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE

SATURN IB LAUNCH VEHICLE EMERGENCY PROCEDURE

2. KSC TEST NUMBER
V-20133

3. EFFECTIVITY
AS-206 AND SUBS

13. LOCATION	14. COMPUTER PROG. IDENTIFICATION	15. EST. TEST TIME
LC-39	PER SUBTASK TCP'S SEQUENCED BY THIS TCP	NOT APPLICABLE

16. SUPPORT REQUIREMENTS

NONE SPECIFICALLY SCHEDULED FOR THIS TCP. EMERGENCY SUPPORT REQUIREMENTS ARE IDENTIFIED AND SCHEDULED PER THE REFERENCED TCP'S SEQUENCED BY THIS TCP.

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

TCP'S AS REFERENCED WITHIN THIS TCP.

18. ITEM CONTINUATION

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REV 32

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 3

1. TEST TITLE
IU POWER APPLICATION/REMOVAL

2. KSC TEST NUMBER
V-21223

3. EFFECTIVITY SL206 & SUBS
AS-512 & SUBS

4. TEST OBJECTIVES

THE PURPOSE OF THIS PROCEDURE IS TO PROVIDE THE INSTRUCTIONS FOR PROPERLY APPLYING AND REMOVING POWER TO THE IU STAGE AND ASSOCIATED ESE, EITHER MANUALLY OR AUTOMATICALLY. INSTRUCTIONS FOR REMOVING POWER IN CERTAIN EMERGENCY SITUATIONS ARE INCLUDED.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST ___ DOES X DOES NOT CONTAIN HAZARDOUS OPERATIONS.

PRIOR TO THE APPLICATION OF POWER, RESISTANCE READINGS WILL BE MADE BETWEEN EACH BUS AND RETURN BUS PER APPLICABLE IU BUS READING SHEET TO ENSURE SYSTEM INTEGRITY. THESE READINGS WILL BE OBTAINED USING SIMPSON 260 OR EQUIVALENT.

ALL IU CABLING WILL BE PER APPLICABLE SCHEMATICS EXCEPT AS OTHERWISE REQUIRED BY OTHER APPROVED PROCEDURES. THE PROCEDURE WILL BE DIVIDED INTO SECTIONS AND SUB-SECTIONS AS NECESSARY TO DISTINGUISH BETWEEN DIFFERENT MODES OF OPERATION.

PART I: PREPARATIONS: THIS SECTION DEFINES IN DETAIL THE SUPPORT REQUIREMENTS IMPOSED BY THIS PROCEDURE AS WELL AS THE PRELIMINARY PREPARATIONS REQUIRED PRIOR TO ENERGIZING ANY POWER SUPPLY.

PART II: THIS SECTION PROVIDES A DETAILED PROCEDURE FOR APPLYING POWER TO THE IU STAGE AND SPECIFIES AT WHAT TIMES THE IU COOLANT AND TELEMETRY WILL BE TURNED ON. THE STAGE VOLTAGE VALUES AND TOLERANCES SPECIFIED ARE PER APPLICABLE IU SPECIFICATIONS AND CHECKOUT PROCEDURE.

PART III: POWER OFF: DETAILS THE SEQUENCE OF EVENTS FOR THE COMPLETE SHUTDOWN OF IU POWER.

APPENDIX 1: EMERGENCY POWER DOWN: THIS SECTION IS DESIGNED FOR THE REMOVAL OF POWER AS QUICKLY AND AS SAFELY AS POSSIBLE. VERIFICATION OF LVDC/LVDA "HALT" AND "MEMORY RELEASE" PRIOR TO POWER REMOVAL IS LEFT TO THE DISCRETION OF THE IBM TEST CONDUCTOR.

PHASE: II & IV

TEST REQUIREMENTS
MSFC TM-011-01-2H
13.2.1.1,2

SEE CONTINUATION SHEET FOR REVISION HISTORY

NO.	DATE	REASON	Contractor Approval	KSC Approval

7. APPROVAL	8. ORGANIZATION	9. DATE
[signature]	IBM/KSC	9/22/71
10. APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
[signature]	LV-ENG-23	9-10-71

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APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 3

1. TEST TITLE
IU POWER APPLICATION/REMOVAL

2. KSC TEST NUMBER
V-21223

3. EFFECTIVITY SL-206 & SUBS
AS-512 & SUBS

13. LOCATION
VAB/LC-39 A,B

14. COMPUTER PROG IDENTIFICATION
KA01(512 & SUBS); L401 (206 & SUBS)

15. EST. TEST TIME
2 MEN - 1.0 HOURS

16. SUPPORT REQUIREMENTS

1. INTERSTAGE: CABLES MATED ON LAUNCH VEHICLE

2. OFF-COMPLEX: NONE

3. ON-COMPLEX:
IBM QUALITY ASSURANCE
IBM MECHANICAL
IBM VEHICLE NETWORKS
IBM GROUND NETWORKS (AUXILIARY POWER)
IBM GROUND COMPUTER
IBM DDAS
IBM MEASURING
E & I RECORDERS (TBC)

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

	512 & SUBS	206 & SUBS	
AESS IU ESE :	40M14490	40M67703	V-34017
AESS IU POWER ESE:	40M13604	40M67707	

19. ITEM CONTINUATION

BLOCK 5 CONTINUED:

APPENDIX 2: IU STAGE POWER REMOVAL WITHOUT COMPUTER SUPPORT: THIS IS A NORMAL POWER DOWN EXCEPT THAT SUPPORT IS REQUIRED FROM THE ML/DCE PANEL TO TURN OFF CERTAIN MDO'S SPECIFIED IN THE PROCEDURE.

APPENDIX 3: IU BUS READING SHEET: SELECTED RESISTANCE READINGS ARE MADE IN THE FOLLOWING ESE DISTRIBUTORS: X02-620A1, X02-622A1, X02-623A1 (S-150/207 ONLY), AND X01-664A2. INITIALS OF PERSONS MAKING READINGS AND DATE WILL BE RECORDED.

DATA EVALUATION LIST: THIS SECTION IS PROVIDED TO RECORD MEASUREMENTS THAT WILL BE REVIEWED AT LEAST ONCE EACH WEEK, WHEN IU POWER IS APPLIED. THE DATA SOURCE, IDENTIFICATION NUMBER, DESCRIPTION, REMARKS, CAP/TPR NUMBER, AND INITIALS AND DATE WILL BE RECORDED AND REVIEWED FOR TREND EVALUATION.

CONFIGURATION: VEHICLE MUST BE STACKED.

APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET (CONTINUATION SHEET) — PAGE 3 OF 3

1. TEST TITLE: IU POWER APPLICATION/REMOVAL

2. KSC TEST NUMBER: V-21223

3. EFFECTIVITY: SL-206 & SUBS; AS-512 & SUBS

ITEM CONTINUATION

REV	DATE	REASON	CONT. APPVL	KSC APPVL
A	03-04-68	MODIFY BLOCK 5	S/G.E. LECKIE	S/L.R. DAVIS
B	05-17-68	MODIFY BLOCK 5	S/G.E. LECKIE	S/L.R. DAVIS
C	09-27-68	MODIFY BLOCK 5	S/G.E. LECKIE	S/L.R. DAVIS
D	07-15-70	MODIFY BLOCK 5	S/D.E. SCHMIDT	S/L.R. DAVIS
E	02-05-71	MODIFY BLOCKS 5 AND 15	S/G.E. LECKIE	S/L.R. DAVIS
F	08-15-71	COMPLETE REWRITE	G.E. Leckie 8/23/71	L.R. Davis 9-10-71
G	03/01/72	MODIFY BLOCKS 3,4,5,13,14,16 AND 17	G.E. Leckie 4-7-72	L.R. Davis
-	04/20/73	REVISE BLOCK 18	G.E. Leckie 4/23/73	L.R. Davis
I	06-18-74	REVISE MSFC REQUIREMENTS	J.E. Faucett 7-16	L.R. Davis

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REV 32

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
SWITCH SELECTOR VEHICLE TEST

2. KSC TEST NUMBER
V-21255

3. EFFECTIVITY
SL-206 & SUBS
AS-512 & SUBS

4. TEST OBJECTIVES

THE OBJECTIVE OF THIS TEST IS TO VERIFY THE PROPER OPERATION OF THE SWITCH SELECTOR.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST __ DOES X DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

THIS PROCEDURE VERIFIES PROPER OPERATION OF THE SWITCH SELECTOR WHEN CONNECTED IN FLIGHT CONFIGURATION BY ISSUING ADDRESSES AND COMPLEMENT ADDRESSES. END ITEMS OF ACTIVE SWITCH SELECTOR CHANNELS ARE VERIFIED BY MONITORING VEHICLE AND GROUND DISCRETES.

THE IU WILL BE CONNECTED PER: CID 79091XX AS-511 AND SUBS
CID 79105XX SL-206 AND SUBS

THE FOLLOWING SYSTEMS WILL BE POWERED OFF:

1. FLIGHT COMPUTER
2. STABILIZER
3. RF

PHASE: III, IV, V, VI

TEST REQUIREMENTS:
MSFC: TM-A11-001-2H
13.1A 1.1.5
13.2.1.1.9
13.2.1.2.16

6 REV.	DATE	REASON	Contractor Approval	KSC Approval
F	6/13/74	REVISE MSFC REQUIREMENTS	1-10-74	L.R.Davis
E	3/8/72	REVISED BLOCKS 3, 5, AND 13	4/14/72	L.R.Davis
D	11/23/71	REVISED BLOCK 5 & 16	12/2/71	L.R.Davis
C	3/02/71	CHANGE PREFIX FROM "IV" TO "V"; REVISE BLK 15	S/G.E.LECKIE	S/L.R.DAVIS
B	7/13/70	REVISE BLOCK 1 & 5	S/D.E.SCHMIDT	S/L.R.DAVIS
A	6/10/70	REVISED BLOCKS 1,3,5,13,16, & 17	S/D. SCHMIDT	S/L.R.DAVIS

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
S/J. C. PEURRUNG	IBM - K73	SEPTEMBER 20, 1967
10. NASA KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
S/J. K. DAVIDSON	LV-GDC-25	OCTOBER 21, 1967

KSC FORM 21-114 7-67

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
SWITCH SELECTOR VEHICLE TEST

2. KSC TEST NUMBER
V-21255

3. EFFECTIVITY
SL-206 & SUBS
AS-512 & SUBS

13. LOCATION
VAB/LCC 39A,B,

14. COMPUTER PROC. INDENTIFICATION
N/A

15. EST. TEST TIME
11 MEN -- 15 MINUTES EA.

16. SUPPORT REQUIREMENTS

INTERSTAGE: PRIOR TO ESE/GSE TEST (V-20025), NONE. AFTER PERFORMANCE OF ESE/GSE TEST: S/C, S-IC

OFF-COMPLEX: NONE

ON-COMPLEX:
IBM QUALITY ASSURANCE
IBM VEHICLE NETWORKS
IBM MECHANICAL
IBM EDS
IBM MEASURING
IBM FLIGHT CONTROL

17. OTHER APPLICABLE REFERENCE DOCUMENTATION
IU ELECTRICAL SCHEMATIC 79101 XX-AS-5XX AND SUBS
SL-206 AND SUBS

18. ITEM CONTINUATION

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REV 32

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
ELECTRICAL BONDING OF COMPONENTS

2. KSC TEST NUMBER
V-21478

3. EFFECTIVITY AS-206 & SUBS
AS-511 & SUBS

4. TEST OBJECTIVES

TO MEASURE AND RECORD DC RESISTANCE READINGS BETWEEN MOUNTED COMPONENTS AND A SINGLE UMBILICAL GROUND TO ENSURE PROPER ELECTRICAL BONDING. BONDING BETWEEN STAGES S1B/CAS/IU AND SC/FAS/IU WILL ALSO BE MEASURED.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION (REPLACES IV-21250)

THIS TEST ___ DOES X DOES NOT CONTAIN HAZARDOUS OPERATIONS.

DC RESISTANCE MEASUREMENTS WILL BE MADE FROM AN UMBILICAL GROUND TO INDIVIDUAL FLIGHT COMPONENTS USING A PRECISION RESISTANCE BRIDGE. EACH COMPONENT WILL BE THE FLIGHT ITEM, PROPERLY MOUNTED. IN ADDITION, THE TWO IU STAGE INTERFACES WILL ALSO BE MEASURED FOR PROPER BONDING. REFERENCE SPECIFICATION NO. 7915798. FLIGHT COMPONENTS WHICH ARE INSTALLED OR REINSTALLED SUBSEQUENT TO THE PERFORMANCE OF THIS TEST WILL BE MEASURED ON AN INDIVIDUAL BASIS AS SOON AS PRACTICAL FOLLOWING INSTALLATION.

CONFIGURATION: N/A

PHASE: IA, II, III, IV, V, VI

TEST REQUIREMENTS

	SL-206 & SUBS
MSFC: TM-011-001-2H	MSFC: 7921601
1.3.5.2	0.3.4.0.2
1.3.5.3	

REV	DATE	REASON	Contractor Approval	KSC Approval
	[illegible]	REVISE MSFC REQUIREMENTS	[signature]	[signature]
	[illegible]	REVISE MSFC REQUIREMENTS	[signature] 1-17	[signature]
F	1 [illegible]	REVISED BLOCKS 4,5 & 17	[signature] 11/[illegible]	[signature]
A	5/01/72	REVISE BLOCKS 5 AND 16	[signature] 5/1/72	[signature]

6. [illegible] APPROVAL

7. ORGANIZATION
IBM - K/S

8. DATE
4/23/71

9. [illegible] APPROVAL

10. ORGANIZATION
[illegible]

11. APPROVAL DATE
4/26/71

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
ELECTRICAL BONDING OF COMPONENTS

2. KSC TEST NUMBER
V-21478

3. EFFECTIVITY AS-206 & SUBS
AS-511 & SUBS

13. LOCATION
VAB, LC39A,B,C

14. COMPUTER PROC. INDENTIFICATION
N/A

15. EST. TEST TIME
2 MEN -- 5 HOURS EA

16. SUPPORT REQUIREMENTS

INTERSTAGE: N/A

OFF-COMPLEX: N/A

ON-COMPLEX: FACILITY OIS
IBM QUALITY
IBM VEHICLE NETWORKS

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

7921601
7916404A

18. ITEM CONTINUATION

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REV 32

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1 TEST TITLE
IU BATTERY ACTIVATION, MONITORING AND DISCHARGE

2 KSC TEST NUMBER
V-21479

3 EFFECTIVITY
SL-206 & SUBS
AS-510 & SUBS

4 TEST OBJECTIVES

TO ACTIVATE, LOAD TEST, AND ELECTRICALLY CHECK IU BATTERIES. TO MONITOR VOLTAGE, CURRENT AND TEMPERATURE OF IU BATTERIES IN THE LAB AND AFTER INSTALLATION IN THE VEHICLE. TO DISCHARGE IU FLIGHT BATTERIES USED FOR TESTING, ACTIVATED AS SPARE, OR ACTIVATED FOR FLIGHT BUT NOT USED.

5 TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION (REPLACES IV-21254)

THIS TEST XX DOES DOES NOT CONTAIN HAZARDOUS OPERATIONS.

THE FLIGHT BATTERY IS ACTIVATED BY THE ADDITION OF ELECTROLYTE. FOR BUSSES 6D10, 6D30, 6D40 AND SPARE ACTIVATE 19 CELLS; 6D20, 18 CELLS. THE CELL VOLTAGES ARE CHECKED. THE CIRCUIT POLARITY IS CHECKED. A PRESSURE TEST IS PERFORMED. THE BATTERY IS LOAD TESTED TO THE EXPECTED CURRENT. THE PROPER BLIND PLUG IS SELECTED TO PROVIDE THE PROPER VOLTAGE AT EXPECTED LOAD CURRENT.

THE VOLTAGE, CURRENT AND TEMPERATURE (IF TEMPERATURE MEASUREMENTS ARE AVAILABLE) WILL BE MONITORED AND RECORDED EVERY THIRTY (30) MINUTES AFTER BATTERIES ARE INSTALLED.

CONNECT LOAD BANK TO BATTERY. SET LOAD BANK TO DESIRED LOAD AND DISCHARGE BATTERY. VOLTAGE, CURRENT, TEMPERATURE AND TIME WILL BE RECORDED. AFTER THE BATTERY IS DISCHARGED, INSERT JUMPER TO POSITIVE AND NEGATIVE TERMINALS. FORTY-EIGHT (48) HOURS OF "SHORT-CIRCUITING" IS MANDATORY PRIOR TO PLACING BATTERY IN SEALED CONTAINER FOR SHIPMENT.

ACTIVATION WILL BE PERFORMED DURING THE MINUS COUNT AS CALLED OUT IN THE INTEGRATED TEST PROCEDURES AND LAUNCH COUNTDOWN PROCEDURE.

PHASE: IV, V

TEST REQUIREMENTS

MSFC: TM-011-001-2H
14.0.4.3

AS-206 & SUBS
MSFC: 7921601
0.3.4.1.0.1
0.3.4.1.1.1
0.3.4.1.1.1.1
0.3.4.1.1.1.2

1 REV.	DATE	REASON	Contractor Approval	KSC Approval
A	6/15/71	REVISE MSFC REQUIREMENTS		
B	7/08/71	REVISE BLOCKS 5, 17, 18	S/G. Leckie 7-14-71	S/L. Davis
C	8/12/71	REVISE MSFC REQUIREMENTS	S/G.LECKIE	S/L.DAVIS
D	9/13/71	REVISE BLOCK 5	S/G.LECKIE	S/L.DAVIS

7 CONTRACTOR APPROVAL	8 ORGANIZATION	9 DATE
S/ G.E. LECKIE	IBM - K73	4/23/71
10 NASA-KSC APPROVAL	11 ORGANIZATION	12 APPROVAL DATE
S/ L.P. DAVIS	LV-GOC-25	4/26/71

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1 TEST TITLE
IU BATTERY ACTIVATION, MONITORING AND DISCHARGE

2 KSC TEST NUMBER
V-21479

3 EFFECTIVITY
SL-206 & SUBS
AS-510 & SUBS

13. LOCATION
VAB, 25E18

14. COMPUTER PROC. INDENTIFICATION
N/A

15 EST. TEST TIME
7 MEN - 9 HOURS

16. SUPPORT REQUIREMENTS

INTERSTAGE: N/A

OFF-COMPLEX: IBM QA
VEHICLE NETWORKS
NASA REPRESENTATIVE
BOEING BATTERY CONSOLE REPRESENTATIVE

ON-COMPLEX: N/A

17. OTHER APPLICABLE REFERENCE DOCUMENTATION
1. R-ASTR-E: OPERATIONAL MANUAL FOR FLIGHT BATTERY TEST CONSOLE, ASTRIONICS LABS
2. ACTIVATION, TEST, AND HANDLING PROCEDURE FOR MAP 4240 BATTERIES, ASTRIONICS LABS
3. IBM DRAWING 7915893-001, BATTERY ASSEMBLY (UNACTIVATED), AS-206 & SUBS

18. ITEM CONTINUATION

BLOCK 17 (CONTINUED)

4. IBM DRAWING 7915893-009, BATTERY ASSEMBLY (UNACTIVATED), SL-513, 515
5. IBM DRAWING 40Z20780-001, BATTERY ASSEMBLY (ACTIVATED), AS-206 & SUBS
6. IBM DRAWING 40Z20780-009, BATTERY ASSEMBLY (ACTIVATED), SL-513, 515
7. IBM PROCEDURE 7915666, BATTERY SHIPPING AND HANDLING

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE

Test Procedure - Reworked Wire Harness

2. KSC TEST NUMBER
V-21496

3. EFFECTIVITY
511 & Subs; 206 & Subs

4. TEST OBJECTIVES

To verify the integrity of stage harnesses affected by modification or repair after stage arrival at KSC.

5. TEST DESCRIPTION/EQUIPMENT STATUS/CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT CONTAIN HAZARDOUS OPERATIONS.

This TCP provides the method for isolation resistance and continuity testing of stage harnesses after rework. The TCP will be activated upon stage arrival at KSC and will remain open until just prior to launch. A continuous data log will document each harness as it is tested and the reason for test.

The TCP provides for megger testing of a wire harness only by PCR to the TCP, upon approval of the specific test requirement by MDAC Electronics Engineering and LVO-GDC.

MSFC T.R. Not Applicable

6. REV.	DATE	REASON	Contractor Approval	KSC Approval

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
R. F. Machette	MDAC	9-8-71
10. NASA-KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
[signature]	LV-GDC-23	9/13/71

KSC FORM [illegible] (10-17-67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE

Test Procedure - Reworked Wire Harness

2. KSC TEST NUMBER
V-21496

3. EFFECTIVITY
511 & Subs; 206 & Subs

13. LOCATION	14. COMPUTER PROC. INDENTIFICATION	15. EST. TEST TIME
LC 39	N/A	

16. SUPPORT REQUIREMENTS

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE: IU VEHICLE NETWORKS PRE-POWER CHECKS

2. KSC TEST NUMBER: V-21497

3. EFFECTIVITY: SL-206 & SUBS
AS-512 & SUBS

THE PURPOSE OF THIS TEST IS TO PROVIDE A SYSTEMATIC METHOD FOR RESTORING THE IU ESE SYSTEM TO PRE-POWER STATUS AFTER A VEHICLE LAUNCH.

THIS TEST X DOES NOT CONTAIN HAZARDOUS OPERATIONS.

THIS TEST CONTAINS SEVEN (7) PARTS

PART 1 - DOCUMENTATION, EQUIPMENT AND POWER REQUIREMENTS

Documentation, equipment and Power Requirements are defined.

PART 2 - POST LAUNCH OPERATIONS

Distributor Integrity Seals are verified.
Patchboards are removed and Pins are inspected.
Distributor Paddle Pins are inspected and cleaned.
Relay and Diode Modules are removed and tested.
Circuit Breakers are tested at discretion of Engineering and Reliability.
Time Delay Relays are checked.
Crossover Distributor Taper Pins are pull tested.
CAT Power Distributor is inspected. Power Contactors are checked.
Umbilical Cables are inspected for damage and usable Safety Wire Holes.

PART 3 - TEST BOX VALIDATION

IU-GSE and IU/SC INTERFACE Fuse Boxes and Adapter Cables are continuity and megger checked. Fuses are verified.
Portable CAT Distributor is continuity checked.
Battery Substitute Assemblies are continuity checked and pressure tested.
Test Box Drawings are verified for discrepancies V.S. hardware changes.

PART 4 - CONTINUITY AND MEGGER CHECK OF CABLES

CAT and ESE Cables are continuity and megger checked.

NO.	DATE	REASON	Contractor Approval	KSC Approval
[illegible]	[illegible]	DELETE MSFC REQUIREMENTS	[signature]	[signature]
A	8/30/72	REVISE BLOCKS 3, 13 AND 18	[signature]	[signature]

4. PREPARED BY	5. ORGANIZATION	6. DATE
[signature]	IBM/K73	11/10/71
7. APPROVED BY	8. ORGANIZATION	9. APPROVAL DATE
[signature]	NASA/KSC	11/10/71

APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET 2

PAGE 2 OF 2

1. TEST TITLE: IU VEHICLE NETWORKS PRE-POWER CHECKS

2. KSC TEST NUMBER: V-21497

3. EFFECTIVITY: SL-206 & SUBS
AS-512 & SUBS

11. LOCATION	12. COMPLETION INDICATION	13. EST. TEST TIME
VAB/LC-39 A, B	N/A	4 MEN - 52 HOURS

16. SUPPORT REQUIREMENTS

INTERSTAGE: NONE

OFF COMPLEX: NONE

ON COMPLEX: IBM QUALITY ASSURANCE
OIS

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

18. ITEM CONTINUATION

PART 5 - PRE-INTERCONNECT CONTINUITY CHECKS

IU ESE Cables are disconnected in preparation for resistance readings.

PART 6 - INTERCONNECT CONTINUITY CHECKS

Resistance Readings are made from the ESE Distributors to the vehicle end of the Umbilical Cables.

PART 7 - POST INTERCONNECT CONTINUITY AND MEGGER CHECK OPERATIONS

Distributors are recabled.
Dust Caps are placed on spare distributor jacks.
Patchboards are reinstalled.
Relay and Diode Modules are reinstalled.
1137W133, 6281W1, 6281W15, 1244-201W1 are continuity checked.

CONFIGURATION: Equipment in place, IU Ground Power OFF.

PHASE: 1A, 1B

TEST REQUIREMENTS:

N/A

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
LOW BAY POWER SETUP

2. KSC TEST NUMBER
V-21535

3. EFFECTIVITY
206 & SUBS

TEST OBJECTIVES

1) VEHICLE BUS RESISTANCE MEASUREMENTS
2) CONNECT THE UMBILICALS
3) TO APPLY GROUND AND STAGE POWER
4) VERIFY PROPER SWITCH SELECTOR OPERATION
5) RESET ALL STAGE SWITCH SELECTOR FUNCTIONS
6) REMOVAL STAGE AND GROUND POWER

TEST DESCRIPTION EQUIPMENT STATUS/CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT CONTAIN HAZARDOUS OPERATIONS.

THIS TEST CONSISTS OF THE FOLLOWING:

1) PREPARATIONS

A. VEHICLE BUS RESISTANCE MEASUREMENTS WITH UMBILICALS DISCONNECTED.
B. CONNECT THE ELECTRICAL UMBILICALS.
C. CIRCUIT BREAKER AND PANEL SWITCH POSITIONS ARE VERIFIED.
D. BUS RESISTANCES ARE VERIFIED NORMAL.

2) POWER-UP

A. GROUND POWER IS APPLIED AND ALL EXPECTED TALKBACKS VERIFIED.
B. STAGE POWER IS APPLIED WITH THE EXCEPTION OF SEQUENCER POWER, AND ALL EXPECTED TALKBACKS ARE VERIFIED.

3) SWITCH SELECTOR TESTS

A. PROPER SWITCH SELECTOR OPERATION IS VERIFIED.
B. ALL STAGE SWITCH SELECTOR FUNCTIONS ARE RESET.
C. SEQUENCER POWER IS APPLIED.

4) POWER OFF

A. STAGE AND GROUND POWER IS REMOVED IN A SEQUENCE OPPOSITE TO THAT ABOVE.
B. AFTER COMPLETION OF LOW BAY C/O THE UMBILICALS ARE DISCONNECTED.

REV.	DATE	REASON	Contractor Approval	KSC Approval

CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
G S Hagami	MCDONNELL DOUGLAS	1-31-72
NASA KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
	LV-GDC-23	3-1-72

KSC FORM 21-938 7 67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
LOW BAY POWER SETUP

2. KSC TEST NUMBER
V-21535

3. EFFECTIVITY
206 & SUBS

13. LOCATION
LOW BAY

14. COMPUTER PROC. INDENTIFICATION
NONE

15. EST. TEST TIME
1 HOUR

16. SUPPORT REQUIREMENTS

SID-21535-D

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

18. ITEM CONTINUATION

KSC TEST SPEC AND CRITERIA REQUIREMENTS

NOT APPLICABLE

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE: BATTERY SUBSTITUTE VERIFICATION (S-IVB/S-IB)

2. KSC TEST NUMBER: V-21535

3. EFFECTIVITY: GSE

4. TEST OBJECTIVES

TO VERIFY ELECTRICAL CIRCUITRY AND CALIBRATION OF ELECTRICAL SENSING DEVICES WITHIN FOUR BATTERY SUBSTITUTE ASSEMBLIES USED ON SIVB STAGE.

5. TEST DESCRIPTION/EQUIPMENT STATUS/CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

THE TEST CONTAINS THE FOLLOWING ELEMENTS:

A. VERIFICATION OF ELECTRICAL CONSOLE OPERATION

B. RESISTANCE CHECKS

C. T/M VOLTAGE TEST

D. T/M CALIBRATION CHECK

E. T/M CURRENT TEST

F. T/M TEMPERATURE AND HEATER TEST

G. PRESSURE TEST

CONFIGURATION: LABORATORY TEST

6 REV.	DATE	REASON	Contractor Approval	KSC Approval
A	8-20-74	REVISED TO INCLUDE THE TWO UNIT, AFT BUS 2 BATTERY SUBSTITUTE UNITS		

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
G S Nagano	MCDONNELL DOUGLAS	1-31-72
10. NASA-KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
	LV-GDC-23	2-1-72

KSC FORM 21-66 (7/67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE: BATTERY SUBSTITUTE VERIFICATION (S-IVB/S-IB)

2. KSC TEST NUMBER: V-21535

3. EFFECTIVITY: GSE

13. LOCATION	14. COMPUTER PROG. INDENTIFICATION	15. EST. TEST TIME
VAB/25B18	NONE	24 HOURS

16. SUPPORT REQUIREMENTS

BATTERY CHECKOUT CONSOLE 40M22080

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

40M71361 BATTERY SUBSTITUTE S-IVB, S-1B, FWD 2
40M67493 BATTERY SUBSTITUTE S-IVB, S-1B, FWD 1
40M67501 BATTERY SUBSTITUTE S-IVB, S-1B, AFT 2

18. ITEM CONTINUATION

17.) Continued - 40M71360 BATTERY SUBSTITUTE S-IVB, S-1B, AFT 1

KSC TEST SPEC AND CRITERIA REQUIREMENTS

NOT APPLICABLE

REV 32

REV 32

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
VEHICLE INTERFACE COMPATIBILITY TEST

2. KSC TEST NUMBER
V-21537

3. EFFECTIVITY
206 & SUBS

4. TEST OBJECTIVES

THE OBJECTIVE OF THIS TEST IS TO VERIFY THE COMPATIBILITY OF THE S-IVB INTERFACE WIRING WITH I.U. AND S-IB. INCLUDED IN CHECKOUT ARE LOX AND LH TANK COMPONENTS, EBW PULSE SENSORS AND RANGE SAFETY SAFING PLUGS.

5. TEST DESCRIPTION EQUIPMENT STATUS/CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

THIS TEST CONSISTS OF THE FOLLOWING:

1. THROUGH STAGE WIRING (FROM FORWARD TO AFT INTERFACE) CONTINUITY IS VERIFIED. THE IMPEDANCE OF EACH PIN ON EACH INTERFACE CONNECTOR IS MEASURED WITH REFERENCE TO S-IVB GROUND. THE MEASUREMENTS ARE COMPARED TO EXPECTED VALUES.
2. INSULATION RESISTANCE AND CAPACITANCE OF THE P.U. PROBE IS VERIFIED.
3. RESISTANCE OF THE LOX AND LH2 CHILLDOWN PUMPS THROUGH THE POWER INPUT CABLE IS VERIFIED.
4. RESISTANCE OF THE ECS ENVIRONMENTAL CONTROL TEMPERATURE ASSEMBLIES IS VERIFIED.
5. RESISTANCE OF THE EBW FIRING UNITS THROUGH THE OUTPUT CABLE IS VERIFIED.
6. THE CAPACITANCE OF THE LOX AND LH2 DEPLETION AND LEVEL SENSORS IS VERIFIED.
7. RANGE SAFETY SAFING PLUGS ARE REMOVED, CHECKED PER TCP V-21225 AND REINSTALLED.
8. EBW PULSE SENSORS ARE REMOVED, CHECKED PER TCP V-21482 AND REINSTALLED.
9. CIRCUITS NOT FUNCTIONALLY CHECKED DURING SUBSYSTEM TESTING ARE IMPEDANCE CHECKED.
10. BATTERY FIT CHECKS ARE PERFORMED.
11. INSURE CORRECT FUNCTIONAL TERMINATION OF LH AND LOX CONTROL AND INSTRUMENTATION LEVEL SENSORS.

REV.	DATE	REASON	Contractor Approval	KSC Approval
F	07-23-74	INSURE CORRECT TERMINATION OF CONTROL INSTRUMENTATION LEVEL SENSORS.		

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
G S Jayne	MCDONNELL DOUGLAS	1-31-72
10. NASA-KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
F M Bruce	LV-GDC-23	2-1-72

KSC FORM 23-338 (7/67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
VEHICLE INTERFACE COMPATIBILITY

2. KSC TEST NUMBER
V-21537

3. EFFECTIVITY
206 & SUBS

13. LOCATION	14. COMPUTER PROC. INDENTIFICATION	15. EST. TEST TIME
LOW BAY	NONE	16 HOURS

16. SUPPORT REQUIREMENTS

NONE

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

V-21225 R/S CONTROLLER
V-21482 EBW PULSE SENSOR
V-34013 BATTERY FIT CHECK

18. ITEM CONTINUATION

CONFIGURATION: THE S-IVB WILL BE LOCATED IN LOW BAY AND UMBILICALS WILL NOT BE MATED.

KSC TEST SPEC & CRITERIA REQUIREMENTS (1B87621)

0.2.2.4.4.1
0.2.2.4.4.2
0.2.2.4.4.3
0.2.2.4.4.4
0.2.2.4.4.5
0.2.2.4.4.6
0.2.2.4.4.7
0.2.2.4.4.8
0.2.2.4.4.9

KSC OPERATIONS APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET	PAGE 1 OF 2
1. TEST TITLE: SIVB ELECTRICAL SUBSYSTEMS CHECKOUT (AUTOMATIC)	2. KSC TEST NUMBER: V-21538
	3. EFFECTIVITY: 207 & SUBS

4. TEST OBJECTIVES

THE OBJECTIVE OF THIS PROCEDURE IS TO VERIFY THE STAGE POWER DISTRIBUTION CIRCUITS, STAGE CONTROL SWITCHING CIRCUITS, AND ASSOCIATED ESE CIRCUITS. THE TCP VERIFIES THE NECESSARY PREPARATIONS FOR EXECUTION OF AUTO PROGRAMS, EAPD (POWER DISTRIBUTION), EASR (RANGE SAFETY SUBS), EAEB (EBW SUBS), EAPU (P.U. SUBSYSTEM), EAPX (POWER TRANSFER).

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST [ ] DOES [X] DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

1. THE C/D INVERTERS ARE FUNCTIONALLY TESTED WITH LOAD SIMULATORS.
2. STATIC CURRENT LOADS OF MAJOR SUB-ASSEMBLIES AND COMPONENTS ARE VERIFIED.
3. T/M SYSTEMS ARE ACTIVATED (CLOSED LOOP) AND R.F. SILENCE IS VERIFIED.
4. STAGE LOGIC CIRCUITS AND INTERLOCKS ARE FUNCTIONALLY CHECKED.
5. VEHICLE POWER TRANSFER WITH ASSOCIATED CONTROL CIRCUITS IS VERIFIED.
6. SWITCH SELECTOR COMPLIMENT CODES ARE ISSUED AND THE PROPER RESPONSES VERIFIED.
7. DEPLETION SENSOR LOGIC CHECKS ARE VERIFIED.
8. EBW AND RANGE SAFETY PULSE SENSOR SELF TEST CIRCUIT IS VERIFIED.
9. THE EBW AND RANGE SAFETY FIRING UNITS CHARGING TIMES AND VOLTAGE LEVELS ARE VERIFIED.
10. EBW BLEED CIRCUITS ARE VERIFIED.
11. ALL FIRING UNITS ARE CHARGED, FIRE COMMANDS ARE ISSUED, AND THE PROPER PULSE SENSOR RESPONSE IS VERIFIED.
12. THE RANGE SAFETY ARM AND ECO, PROPELLANT DISPERSION, AND SYSTEMS OFF COMMANDS ARE ISSUED AND PROPER RESPONSES ARE VERIFIED.
13. THE RANGE SAFETY POWER INTERNAL/EXTERNAL CIRCUITS ARE VERIFIED.
14. THE RANGE SAFETY SAFE AND ARM DEVICE IS VERIFIED.
15. PROPELLANT UTILIZATION SUB-SYSTEM IS VERIFIED.

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
A	12-4-72	UPDATE FOR TEST SPEC & CRITERIA REQUIREMENTS		

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
S/G. S. IKEGAMI	MCDONNELL DOUGLAS	1-31-72
10. NASA KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
S/D. R. JONES	LV-GDC-23	2-1-72

KSC FORM 23 338 (7 67)

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)	PAGE 2 OF 2
1. TEST TITLE: SIVB ELECTRICAL SUBSYSTEM CHECKOUT (AUTOMATIC)	2. KSC TEST NUMBER: V-21538
	3. EFFECTIVITY: 207 & SUBS
13. LOCATION: LC 39	14. COMPUTER PROC. INDENTIFICATION: EAPD, EASR, EAEB, EAPU, EAPX
	15. EST. TEST TIME: 4 HOURS

16. SUPPORT REQUIREMENTS

RD-21401

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

V-21262 SIVB POWER SETUP PROCEDURE

18. ITEM CONTINUATION

KSC TEST SPEC & CRITERIA REQMTS (1B86721)

0.2.2.1.1.1
0.2.2.1.1.2
0.2.2.1.1.3
0.2.2.1.1.4
0.2.2.1.1.5
0.2.2.1.1.6
0.2.2.1.1.7
0.2.2.1.1.8
0.2.2.1.1.9
0.2.2.1.1.10
0.2.2.1.1.11
0.2.2.1.1.13
0.2.2.1.1.16
0.2.2.1.2.1.1
0.2.2.1.2.1.2
0.2.2.1.2.1.3
0.2.2.1.2.1.4
0.2.2.1.2.1.5
0.2.2.1.2.1.6
0.2.2.1.2.2.1
0.2.2.1.2.2.2
0.2.2.1.2.2.3
0.2.2.1.2.2.4
0.2.2.1.2.2.5
0.2.2.1.3.1
0.2.2.1.4.0
0.2.2.3.1.1
0.2.2.3.1.2
0.2.2.3.2.1
0.2.2.3.2.2
0.2.2.3.2.3
0.2.2.3.2.4
0.2.2.3.2.5
0.2.2.5.2.1.1
0.2.2.5.2.1.2
0.2.2.5.2.2.1
0.2.2.5.2.2.2
0.2.2.5.2.3
0.2.2.5.3.1
0.2.2.5.3.2

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REV 32

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1 TEST TITLE
INDUCED VOLTAGE DETECTORS, VEHICLE & GROUND; INSTALLATION, OPERATION AND MAINTENANCE

2 KSC TEST NUMBER
V-21564

3 EFFECTIVITY
AS-515
SL-206 & SUBS

4 TEST OBJECTIVE
TO PROVIDE PROPER INSTRUCTION FOR INSTALLING, REMOVING, MAINTAINING AND OPERATING INDUCED VOLTAGE DETECTORS IN IU STAGE. TO PROVIDE OPERATING INSTRUCTIONS FOR PEAK VOLTAGE MONITORS INSTALLED ON 280' LEVEL OF MOBILE LAUNCHER.

5 TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION
THIS TEST DOES X DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

THIS PROCEDURE IS DIVIDED INTO TWO PARTS.

PART A PROVIDES FOLLOWING FOR STAGE DETECTORS:

1. CALIBRATION INSTRUCTIONS AND FREQUENCY
2. INSTALLATION INSTRUCTIONS
3. MAINTENANCE INSTRUCTIONS
4. OPERATING INSTRUCTIONS
5. REMOVAL INSTRUCTIONS

PART B PROVIDES FOLLOWING FOR GROUND DETECTORS:

OPERATING INSTRUCTIONS

SUPPORT REQUIREMENTS: NONE

CONFIGURATION: VEHICLE DETECTORS TO BE INSTALLED PRIOR TO TRANSFER TO PAD.

PHASES V AND VI

MSFC REQUIREMENTS:
TM-011-001-2H
13.0.1.2

REV.	DATE	REASON	Contractor Approval	KSC Approval
B	FEB 16 74	REVISE MSFC REQUIREMENTS	J E Jones 2-10-74	F R Davis
A	DEC 14	REVISE BLOCKS 3 & 15	J E Jones 10 DEC 73	R R Davis 12/11/73

7 PREPARED APPROVAL
G E Leslie

8 ORGANIZATION
IBM/K73

9 DATE
9/20/72

10 REVIEW AND APPROVAL
For L K Davis

11 ORGANIZATION
KSC-BAC-25

12. APPROVAL DATE
9/21/72

KSC FORM 21-551 (1-67)

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1 TEST TITLE
INDUCED VOLTAGE DETECTORS, VEHICLE & GROUND; INSTALLATION, OPERATION AND MAINTENANCE

KSC TEST NUMBER
V-21564

EFFECTIVITY
AS-515
SL-206 & SUBS

13 LOCATION
IU STAGE & ML 1,2 &/OR 3

14 COMPUTER PROGRAM IDENTIFICATION

15 MAN-TEST SUMMARY
2 MEN - 1 C-HOUR

16 SUPPORT REQUIREMENTS
NONE

17. OTHER APPLICABLE REFERENCE DOCUMENTATION
50M18360 - OPERATION AND CALIBRATION INSTRUCTIONS FOR THE INDUCED VOLTAGE DETECTORS (IVD)

18. ITEM CONTINUATION

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KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
LUT NETWORKS ML-1 PURGE VERIFICATION

2. KSC TEST NUMBER
V-21565

3. EFFECTIVITY
GSE

4. TEST OBJECTIVES
TO VERIFY A POSITIVE PRESSURE WITHIN ALL PURGED ELECTRICAL ENCLOSURES THAT ARE THE RESPONSIBILITY OF THE LUT NETWORKS GROUP.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

THIS PROCEDURE WILL BE ACCOMPLISHED BY:

1. SECURING AND SEALING ELECTRICAL ENCLOSURES TO FACILITATE POSITIVE PRESSURE BUILDUP WITHIN THE ENCLOSURE.
2. VERIFYING EXISTIENCE OF SAID POSITIVE PRESSURE.

THE VERIFICATION WILL BE ACCOMPLISHED PRIOR TO EACH OF THE FOLLOWING MAJOR TESTS:

1. MOVE TO PAD
2. HYPERGOLIC LOAD
3. CDDT
4. LAUNCH COUNTDOWN

6. REV.	DATE	REASON	Contractor Approval	KSC Approval

7. NAME FOR APPROVAL	8. ORGANIZATION	9. DATE
T. L. McCraney	BATC 5-8730	10/6/72
10. NASA KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
T. P. Overstreet	LV-GDC-22	10/6/72

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
LUT NETWORKS ML-1 PURGE VERIFICATION

2. KSC TEST NUMBER
V-21565

3. EFFECTIVITY
GSE

12. LOCATION
ML-1

14. COMPUTER PROG. INDENTIFICATION
N/A

15. EST. TEST TIME
24 HOURS

16. SUPPORT REQUIREMENTS

50 PSI GN_2 PURGE

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
MOBILE LAUNCHER PHASEDOWN ELECTRICAL

2. KSC TEST NUMBER
V-21572

3. EFFECTIVITY
GSE-LC 39-3

4. TEST OBJECTIVES

The objective of this task is to place the Mobile Launcher in a downmode status and outline surveillance criteria.

5. TEST DESCRIPTION/EQUIPMENT STATUS/CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

The following is a list of tasks to be performed:

1. Inspect and check all ESE cables.
2. Seal all cable connections and/or unconnected cable ends.
3. Downmode mobile launcher equipment mounted in distributor racks.
4. Downmode portable OAT cables and equipment. Transfer interchangeable items to other programs.
5. Downmode all umbilical tower equipment on the 220, 240, & 260 foot levels including pneumatic consoles, crossover junction boxes, and power distributor boxes.
6. Establish surveillance plan and requirements.

6. REV.	DATE	REASON	Contractor Approval	KSC Approval

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
/S/ W. J. HAMILTON	McDonnell Douglas	11/17/72
10. NASA-KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
/S/ D. R. JONES	LV-GDC-23	11/17/72

KSC FORM 22-356 (7/67)

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
MOBILE LAUNCHER PHASEDOWN ELECTRICAL

2. KSC TEST NUMBER
V-21572

3. EFFECTIVITY
GSE LC 39-3

13. LOCATION
ML #3

14. COMPUTER PROC. INDENTIFICATION
None

15. EST. TEST TIME
50 Hours

16. SUPPORT REQUIREMENTS

None

17. OTHER APPLICABLE REFERENCE DOCUMENTATION
MDAC - DPS's, CID's 40M12377, 40M12384
Main Equipment Index Drawing 40M57101

18. ITEM CONTINUATION

Configuration

Post 512 Launch, No S-IVB Vehicle

NASA-KSC Authorization

LV-TMO/330-72-MDAC-36, August 8, 1972

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REV 32

KSC OPERATIONS APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET	PAGE 1 OF 2
1. TEST TITLE DEE-6C PERIODIC PREVENTIVE MAINTENANCE AND ELECTRONIC CHECKS AND/OR ADJUSTMENTS	2. KSC TEST NUMBER V- 21574
	3. EFFECTIVITY GSE - LC39

4. TEST OBJECTIVES

THE OBJECTIVE OF THIS PROCEDURE IS TO PROVIDE A SYSTEM OF PERIODIC CHECKS AND ALIGNMENTS OF THE DEE-6C SYSTEM THAT WILL REDUCE THE NUMBER OF DEE-6 SYSTEM FAILURES DURING VEHICLE SUPPORT TO A MINIMUM.

5. TEST DESCRIPTION/EQUIPMENT STATUS CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

THIS TEST CONSISTS OF MULTIPLE DEE-6 SUBSYSTEM CHECKS OR MAINTENANCE TASKS. PARTS II, III, IV AND VI ARE PERFORMED PERIODICALLY - BI-WEEKLY (EVERY TWO WEEKS), QUARTERLY, SEMI-ANNUALLY AND ANNUALLY.

PART V CONSISTS OF ELECTRONIC CHECKS AND/OR ADJUSTMENTS. PART V IS NOT PERIODICALLY SCHEDULED. NORMALLY, APPROPRIATE SECTIONS OF PART V ARE PERFORMED AS A RESULT OF A MAINTENANCE DIAGNOSTIC PROGRAM DETECTING AN ABNORMAL SITUATION OR OUT OF TOLERANCE CONDITION WITHIN THE SPECIFIED SUBSYSTEM UNDER TEST. SECTIONS OF PART V WILL ALSO BE PERFORMED IN CONJUNCTION WITH VEHICLE EVENTS, SUCH AS SV/ML PAD TRANSFER.

ANY PERIODICALLY SCHEDULED PART OR ITS SECTIONS MAY BE PERFORMED AT A GREATER FREQUENCY THAN SPECIFIED WITH SYSTEMS ENGINEER AND LVO-ENG CONCURRENCE. ANY SECTION OF PART V MAY BE PERFORMED AS REQUIRED WITH SYSTEMS ENGINEER AND LVO-ENGINEERING CONCURRENCE.

CONFIGURATION: N/A

TEST REQUIREMENTS
MSFC: N/A

PHASE: N/A

6 REV.	DATE	REASON	Contractor Approval	KSC Approval
A	2-21-74	REVISED BLOCK 5		

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
	IBM-M82	1/26/73
10. NASA/KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
	LV-CDC-27	1/26/73

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)		PAGE 2 OF 2
1. TEST TITLE DEE-6C PERIODIC PREVENTIVE MAINTENANCE AND ELECTRONIC CHECKS AND/OR ADJUSTMENTS		2. KSC TEST NUMBER V-21574
		3. EFFECTIVITY GSE - LC39
13. LOCATION LC-39	14. COMPUTER PROC. INDENTIFICATION N/A	15. EST. TEST TIME 2 MEN, AS REQUIRED

16. SUPPORT REQUIREMENTS

INTERSTAGE: NONE

OFF-COMPLEX: NONE

ON-COMPLEX: OIS
A/C POWER
QUALITY ASSURANCE

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

N/A

18. ITEM CONTINUATION

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KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

S-IB STAGE EBW PULSE SENSOR CHECKOUT PROCEDURE

V-21582

EFFECTIVITY: 207 & Subs

TO VERIFY THE FUNCTIONAL OPERATION OF THE PULSE SENSORS USED IN THE RETROROCKET, SEPARATION, AND PROPELLANT DISPERSION SYSTEMS.

THIS TEST [ ] DOES [X] DOES NOT CONTAIN HAZARDOUS OPERATIONS.

Verify that the EBW pulse sensors operate at the proper voltage level. Each pulse sensor will be checked to insure that it will accept a 2000 VDC pulse for ten consecutive firings (Fire Test) and that it will reject an 1800 VDC pulse for ten consecutive firings (No-Fire Test). If a pulse sensor cannot meet these criteria, it will be adjusted as required and the Fire & No-Fire Tests will be repeated. The test will be performed with the pulse sensors installed on the stage but provisions are made to remove the pulse sensor, if necessary, to facilitate adjustment.

At the conclusion of the Fire & No-Fire Tests, an EBW Pulse Sensor Functional Test will be performed.

PHASE - III

MFSC REQUIREMENTS
N/A

REV	DATE	REASON	Contractor Approval	NASA Approval

CONTRACTOR APPROVAL	ORGANIZATION	DATE
[signature]	CCSD	[illegible]

NASA/KSC APPROVAL	ORGANIZATION	APPROVAL DATE
[signature]	LV-GDC-24	[illegible]

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

S-IB STAGE EBW PULSE SENSOR CHECKOUT PROCEDURE

-21582

207 & Subs

TEST TIME: 6 Hrs.

HB-1/VAB

COMPUTER PROGRAM IDENTIFICATION: N/A

SUPPORT REQUIREMENTS

SIB Stage Power Off for Fire & No-Fire Test
SIB OAT Power Off for Fire & No Fire Test
SIB Stage Power On for Functional Test
SIB OAT Power On for Functional Test

APPLICABLE REFERENCE DOCUMENTATION

40M02852-EBW Pulse Sensor Assembly
40M02332-Cal & Op Procedures for EBW Monitor System Test Set
40M01865 - EBW Monitor System AES
40M01915 - EBW Monitor System Assy.
40M03113 - EBW Pulse Sensor AES

ITEM CONTINUATION

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
Simulated Lightning Test - S-IB-12 Stage

2. KSC TEST NUMBER
V-21583

3. EFFECTIVITY
S-IB-12

4. TEST OBJECTIVES
To demonstrate adequate lightning protection design for the launch vehicle/Apollo-Soyuz hardware.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST XX DOES ☐ DOES NOT CONTAIN HAZARDOUS OPERATIONS.

This test will measure open circuit and common mode voltages induced in critical circuits and magnetic field intensities in selected zones of the S-IB-12 stage. These voltages and intensities will be generated by applying a controlled simulated lightning strike to the aft end of S-IB-12 stage. Resulting data will be analyzed to determine lightning protection adequacy.

The S-IB-12 stage will be configured and equipped for this test as specified by the MSFC S-IB-12 Lightning Test Plan.

MSFC Requirements
None

6. REV.	DATE	REASON	Contractor Approval	KSC Approval

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
[signature]	CCSD	8-15-74
10. NASA-KSC APPROVAL [signature] FOR R D CLAY	11. ORGANIZATION LV-GDC-24	12. APPROVAL DATE 8/15/74

KSC FORM 23-336 (7/67)

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE	2. KSC TEST NUMBER
Simulated Lightning Test - S-IB-12 Stage	V-21583
	3. EFFECTIVITY S-IB-12
13. LOCATION LC-39 VAB Transfer Aisle	14. COMPUTER PROC. INDENTIFICATION None
	15. EST. TEST TIME 2 days

16. SUPPORT REQUIREMENTS

KSC Safety
Fire Support
Medical Support

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

KMI 1710 IB/SF KSC Safety Program
K-V-053 Ground Safety Plan

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
TERMINAL COUNTDOWN SEQUENCER BENCH TEST

2. KSC TEST NUMBER
V-21584

3. EFFECTIVITY
AS 209 & SUBS

4. TEST OBJECTIVES
TO VERIFY THAT THE TCS AND/OR TCS POWER SUPPLY ARE FUNCTIONALLY OPERABLE AND ABLE TO PERFORM THEIR RESPECTIVE FUNCTIONS PRIOR TO INSTALLATION IN THE SYSTEM.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST [ ] DOES [X] DOES NOT CONTAIN HAZARDOUS OPERATIONS.

The TCS and/or TCS Power Supply will be configured on the test bench with fused interrupt boxes and appropriate jumpers.

Switching capability will be provided to simulate various input commands and voltage levels. TCS outputs will be recorded and evaluated to confirm proper counting sequences.

The TCS Power Supply voltage outputs will be verified and the voltage monitor circuits checked for proper upper and lower tolerance limits.

TEST REQUIREMENTS:
MSFC: N/A

6. REV.	DATE	REASON	Contractor Approval	KSC Approval

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
H. M. Kimbrell/W. O. Brown	CCSD	8-28-74
10. NASA-KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
R. F. Clay	LV-GDC-24	8/28/74

KSC FORM 21-836 (7/67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
TERMINAL COUNTDOWN SEQUENCER BENCH TEST

2. KSC TEST NUMBER
V-21584

3. EFFECTIVITY
AS 209 & SUBS

13. LOCATION
Elec. Lab - VAB

14. COMPUTER PROC. INDENTIFICATION
N/A

15. EST. TEST TIME
8 Hours

16. SUPPORT REQUIREMENTS

NONE

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

NONE

18. ITEM CONTINUATION

APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET (CONTINUATION SHEET)	PAGE 3 OF 4
1. TEST TITLE: FLIGHT CONTROL COMPUTER SUBSYSTEM TEST	2. KSC TEST NUMBER: V-23029
	3. EFFECTIVITY: AS-507 & SUBS

ITEM CONTINUATION

(CONTINUED) BLOCK 5

EQUIPMENT STATUS:

A. THE FOLLOWING TEST EQUIPMENT WILL BE USED:

1. INTERRUPT BOX-8 PIN-P/N JB2P0193 OR EQUIVALENT.
2. INTERRUPT BOX-23 PIN-P/N JB2P0217 OR EQUIVALENT.
3. INTERRUPT BOX-30 PIN-P/N JB2P0231 OR EQUIVALENT.
4. INTERRUPT BOX-61 PIN-P/N JB2P0229 OR EQUIVALENT.
5. INTERRUPT BOX-55 PIN-P/N JB2P0228 OR EQUIVALENT.
6. DIGITAL VOLTMETER, HP3440, OR EQUIVALENT.
7. SIMPSON 260.

B. THE FOLLOWING PROCEDURES/TEST MUST BE COMPLETED PRIOR TO PERFORMING THIS TASKS: NONE

CONFIGURATION: FLIGHT CONTROL COMPUTER AND LVDC/LVDA INSTALLED IN LAUNCH VEHICLE.

KSC FORM 23-338A (7/67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET (CONTINUATION SHEET)	PAGE 4 OF 4
1. TEST TITLE: FLIGHT CONTROL COMPUTER SUBSYSTEM TEST	2. KSC TEST NUMBER: V-23029
	3. EFFECTIVITY: AS-507 & SUBS

ITEM CONTINUATION

REV	DATE	REASON	CONTR APPVL	KSC APPVL
A	05-27-68	CHANGE EFFECTIVITY	S/D.A. CREMINS	S/G.W. ELY
B	06-28-68	CHANGE EFFECTIVITY	S/D.A. CREMINS	S/G.W. ELY
C	06-26-68	UPDATE MSFC REQUIREMENTS, MODIFY BLOCK 5	S/D.A. CREMINS	S/G.W. ELY
D	10-30-68	UPDATE TO REFLECT ADDITIONAL TESTING	S/J.C. BOSTICK	S/G.W. ELY
E	03-07-69	REVISE EFFECTIVITY, DELETE 507 & SUBS	S/J.C. BOSTICK	S/G.W. ELY
F	03-07-69	REVISE EFFECTIVITY AND BLOCK 5	S/J.C. BOSTICK	S/G.W. ELY
G	05-29-69	REVISE MSFC REQUIREMENTS	S/G.L. WEAKLEY	S/G.W. ELY
H	05-29-69	REVISE MSFC REQUIREMENTS	S/G.L. WEAKLEY	S/G.W. ELY
I	01-09-70	REVISE MSFC REQUIREMENTS	S/D.A. CREMINS	S/G.W. ELY
J	01-05-71	REVISE MSFC REQUIREMENTS	D.A. Cremins 1-11-71	K.W. Ely 1-11-71
K	10-7-71	V-27192 CANCELLED, REMOVE REFERENCE TO THIS PROCEDURE	ORR [illegible] 10/18/71	WAN K.W. Ely 10/18/71

KSC FORM 23-338A (7/67)

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
CONTROL/EDS RATE GYRO AND CONTROL SIGNAL PROCESSOR SUBSYSTEM TEST (CTC4)

2. KSC TEST NUMBER
V-23030

3. EFFECTIVITY 512 & SUBS
206 & SUBS

4. TEST OBJECTIVES

A. TO EVALUATE THE OPERATION OF THE CONTROL/EDS RATE GYRO AND CONTROL SIGNAL PROCESSOR AS SUBSYSTEM IN THE LAUNCH VEHICLE ENVIRONMENT.

B. TO FUNCTIONALLY VERIFY THE OPERATION OF THE CONTROL/EDS RATE GYRO AND CONTROL SIGNAL PROCESSOR.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST [ ] DOES [X] DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

DESCRIPTION:

A. THE EXCESSIVE RATE SWITCH LEVELS ARE ASCERTAINED.

B. THE COMPARATOR SET LEVELS ARE ASCERTAINED.

C. A TIMED RAMP INPUT WILL BE APPLIED AND A DELTA RATE OUTPUT WILL BE EVALUATED.

D. THIS TEST WILL BE PERFORMED AUTOMATICALLY.

EQUIPMENT STATUS:

A. THE FOLLOWING TEST EQUIPMENT WILL BE USED: N/A

B. THE FOLLOWING PROCEDURES/TEST MUST BE COMPLETED PRIOR TO PERFORMING THIS TASK:

1. V-23153 - CONTROL/EDS RATE GYRO RAMP GENERATOR CALIBRATION
2. V-23155 - CONTROL/EDS RATE GYRO AND CONTROL SIGNAL PROCESSOR POLARITY TEST

CONFIGURATION: A. FLIGHT CONTROL SUBSYSTEM INSTALLED IN LAUNCH VEHICLE.

PHASE: III

TEST REQUIREMENTS
SEE BLOCK 18

6 REV	DATE	REASON	Contractor Approval	KSC Approval
I	8/27/74	REVISED MSFC REQUIREMENTS	C R. Ramey 9/4/74	A. H. Ely 9/4/74
H	4.26.2	EFFECTIVITY CHANGE; REVISE MSFC REQ'MTS	[illegible] 7/11/72	George H. Ely
G	[illegible]	REVISE BLOCKS 5, 14, 16	S/D. CREMINS	S/G. ELY
F	[illegible]	UPDATE MSFC REQUIREMENTS	S/G. WEAKLEY	S/G. ELY
E	[illegible]	REVISE MSFC REQUIREMENTS	S/G. WEAKLEY	S/G. ELY
D	[illegible]	REVISE MSFC REQUIREMENTS	S/J. BOSTICK	S/G. ELY
C	11.2.8	UPDATE TO REFLECT LATEST TEST CONFIGURATION	S/J. BOSTICK	S/G. ELY
B	[illegible]	ADD MSFC DOCUMENT NUMBER	S/D. CREMINS	S/G. ELY
A	[illegible] 15/8	MODIFY TITLE, BLK. 5; ADD MSFC REQ'MTS (504)	S/D. CREMINS	S/G. ELY

7. CONTRACTOR APPROVAL
S/ D. W. CREMINS

8. ORGANIZATION
IBM - 918

9. DATE
2 JANUARY 1968

10. NASA APPROVAL
S/ G. W. ELY

11. ORGANIZATION
LV-GDC-33

12. APPROVAL DATE
1/3/68

KSC FORM 23-338 (7-67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
CONTROL/EDS RATE GYRO AND CONTROL SIGNAL PROCESSOR SUBSYSTEM TEST (CTC4)

2. KSC TEST NUMBER
V-23030

3. EFFECTIVITY 512 & SUBS
206 & SUBS

13. LOCATION
LC-39

14. COMPUTER PROG. INDENTIFICATION
CTC4 - EDS/CRG TEST

15. EST. TEST TIME
4 MEN - 1.0 HOURS

16. SUPPORT REQUIREMENTS

INTERSTAGE: IU GROUND AND STAGE POWER
SIVB STAGE POWER

OFF-COMPLEX: N/A

ON-COMPLEX: FACILITY COMMUNICATIONS (OIS)

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

NONE

18. ITEM CONTINUATION

(CONTINUED FROM BLOCK 5)

TEST REQUIREMENTS

MSFC:: 7921601 TM-011-001-2H

0.3.1.2.1.2.1	B.7.0.1
0.3.1.2.1.2.1.1	
0.3.1.2.1.2.1.2	
0.3.1.2.1.2.1.3	
0.3.1.2.1.2.1.4	
0.3.1.2.1.2.1.5	
0.3.1.2.1.3.1 ✓	
0.3.1.2.1.4.1 ✓	

REV 32

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
CONTROL/EDS RATE GYRO AND CONTROL SIGNAL PROCESSOR POLARITY TEST

2. KSC TEST NUMBER
V-23155

3. EFFECTIVITY 512 & SUBS
206 & SUBS

4. TEST OBJECTIVES

TO VERIFY THAT THE CONTROL/EDS RATE GYRO/CONTROL SIGNAL PROCESSOR INPUT/OUTPUT POLARITIES ARE COMPATIBLE WITH THE VEHICLE FLIGHT CONTROL SYSTEMS POLARITY.

(THIS TEST IS TO BE PERFORMED WITHIN THE SAME SHIFT, OR CONSECUTIVE SHIFTS, AND IMMEDIATELY PRIOR TO FLIGHT CONTROL SYSTEMS GAIN TEST CTC1/CTB1)

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

DESCRIPTION:

A. THE CONTROL/EDS RATE GYRO UNIT WILL BE PHYSICALLY ROTATED ABOUT ITS THREE (3) MAJOR AXES TO COORDINATE AND DOCUMENT INPUT/OUTPUT RELATIONSHIPS.

B. VERIFICATION OF POLARITY IS DEPENDENT UPON SATISFACTORY POLARITY COORDINATION BETWEEN THIS TEST AND THE PHI DOT ($\dot{\phi}$) MEASUREMENTS, THE VALVE CURRENT (I_V) MEASUREMENTS, AND THE HYDRAULIC ACTUATOR POSITION MEASUREMENTS OF THE SIC/SIB A_1 PORTION OF THE SYSTEMS GAIN TEST (CTC1/CTB1).

EQUIPMENT STATUS:

A. THE FOLLOWING TEST EQUIPMENT WILL BE USED: N/A

B. THE FOLLOWING PROCEDURES/TEST MUST BE COMPLETED PRIOR TO PERFORMING THIS TASK: CONTROL/EDS RATE GYRO AND CSP POWER VERIFICATION RAMP GENERATOR AND MEASURING CALIBRATION, V-23153.

CONFIGURATION: FLIGHT CONTROL SUBSYSTEM INSTALLED IN LAUNCH VEHICLE.

PHASE: III

TEST REQUIREMENTS
MSFC: 7921601
0.3.1.2.1.5.1
0.3.1.2.0.3.1

MSFC: TM-011-001-2H
B.1.1.1.1.2

REV	DATE	REASON	Contractor Approval	KSC Approval
F	5/27/74	REVISED MSFC REQUIREMENTS	C R Ramey 9/9/74	H. W. Ely 5-6-74
E	4/26/72	CHANGE EFFECTIVITY, REVISE BLOCKS 4, 5	The Winter 4/11/72	Morgan W. Ely
D	10/15/73	UPDATE MSFC REQUIREMENTS	S/D. CREMINS	S/G. ELY
C	2/7/73	DELETE POWER VERIFICATION CHECK CHG. EFF.	S/J. BOSTIC	S/G. ELY
B	11/14/72	CHANGE TITLE & EFFECTIVITY	S/J. BOSTICK	S/G. ELY
A	10/31/72	UPDATE TO REFLECT EQUIPMENT STATUS	S/J. BOSTICK	S/G. ELY

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
S/ D. A. CREMINS	IBM - 918	JANUARY 2, 1968
10. NASA KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
S/ G. W. ELY	LV-GDC-33	JANUARY 3, 1968

KSC FORM 23 [illegible] 67

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
CONTROL/EDS RATE GYRO AND CONTROL SIGNAL PROCESSOR POLARITY TEST

2. KSC TEST NUMBER
V-23155

3. EFFECTIVITY 512 & SUBS
206 & SUBS

13. LOCATION
LC-39

14. COMPUTER PROC. INDENTIFICATION
N/A

15. EST. TEST TIME
4 MEN - 4 HOURS

16. SUPPORT REQUIREMENTS

INTERSTAGE: IU GROUND AND STAGE POWER
IU MECHANICAL
IU ELECTRICAL
SIVB STAGE POWER

OFF-COMPLEX: N/A

ON-COMPLEX: QUALITY ASSURANCE
FACILITY COMMUNICATIONS (OIS)

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

NONE

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE: CONTROL/EDS RATE GYRO WHEEL SPEED TEST

2. KSC TEST NUMBER: V-23197

3. EFFECTIVITY: 512 & SUBS; 206 & SUBS

4. TEST OBJECTIVES

TO EVALUATE GYRO WHEEL BEARING CONDITION BY THE MEASUREMENT OF WHEEL ACCELERATION PARAMETERS.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

DESCRIPTION:

A BREAKOUT BOX WILL BE CONNECTED TO CSP TEST PLUG J7 IN THE IU. ALL OTHER CSP & CRG CABLES WILL BE VERIFIED TO BE IN FLIGHT CONFIGURATION. AN OSCILLOSCOPE (BATTERY POWERED) WILL BE PREPARED FOR USE.

THE CONTROL/EDS RATE GYROS AND CONTROL SIGNAL PROCESSOR WILL BE ENERGIZED AND WARMED UP FOR AT LEAST 15 MINUTES PRIOR TO BEGINNING THE WHEEL SPEED RUN-UP AND RUN-DOWN TESTING.

TESTING WILL BE ACCOMPLISHED BY MONITORING EACH GYRO WHEEL SPEED SENSOR INDIVIDUALLY AT THE J7 BREAKOUT BOX UTILIZING THE PORTABLE OSCILLOSCOPE. THE CRG SUBSYSTEM WILL BE ENERGIZED FOR EACH GYRO AND THE TIME REQUIRED TO REACH SYNCHRONOUS SPEED WILL BE MEASURED AND RECORDED. THE CRG SUBSYSTEM WILL BE DE-ENERGIZED FOR EACH GYRO AND THE TIME INTERVAL BETWEEN A TWO CYCLE DISPLAY AND A ONE CYCLE DISPLAY (COAST TIME BETWEEN 100 RPS AND 50 RPS) WILL BE RECORDED.

EQUIPMENT STATUS:

A. THE FOLLOWING TEST EQUIPMENT WILL BE USED:

1. INTERRUPT BOX-39 PIN-P/N FC6004 OR EQUIVALENT.
2. OSCILLOSCOPE, BATTERY POWERED, TEKTRONIX MODEL 422 OR EQUIVALENT.
3. STOP WATCH WITH 0.2 SECOND GRADUATION.

B. THE FOLLOWING PROCEDURES/TEST MUST BE COMPLETED PRIOR TO PERFORMING THIS TASK: N/A

PHASE: VA	TEST REQUIREMENTS S-IB	TEST REQUIREMENTS S-V
	MSFC: 7921601	MSFC: 7916404
	0.3.1.2.1.1.1	0.3.1.2.1.1.1
	0.3.1.2.1.1.2	0.3.1.2.1.1.2

(CONTINUED IN BLOCK 18)

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
A	4/26/2	EFF. CHANGE, REVISE BLOCK 5 MSFC REQ'MTS	H. H. Te 5/4/72	George W. Ely

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
S/ G. L. WEAKLEY	IBM - 918	6/23/69
10. NASA-KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
S/ C. A. WHITESIDE	LV-GDC-33	6/23/69

KSC FORM 23-338 (7-67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE: CONTROL/EDS RATE GYRO WHEEL SPEED TEST

2. KSC TEST NUMBER: V-23197

3. EFFECTIVITY: 512 & SUBS; 206 & SUBS

13. LOCATION: LCC/IU/LC-39

14. COMPUTER PROG. IDENTIFICATION: N/A

15. TEST TIME: 5 MIN - 1.5 HOURS

16. SUPPORT REQUIREMENTS

INTERSTAGE: IU GROUND AND STAGE POWER

OFF-COMPLEX: N/A

ON-COMPLEX: QUALITY ASSURANCE
FACILITY COMMUNICATIONS (OIS)
IU ELECTRICAL
DDAS

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

NONE

18. ITEM CONTINUATION

(CONTINUED FROM BLOCK 5)

CONFIGURATION: A. CONTROL/EDS RATE GYROS AND CONTROL SIGNAL PROCESSOR INSTALLED IN LAUNCH VEHICLE.

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
ST-124M STABILIZED PLATFORM DRIFT TEST

2. KSC TEST NUMBER
V-23198

3. EFFECTIVITY
AS REQUIRED

4. TEST OBJECTIVE
TO OBTAIN GYRO AND ACCELEROMETER PERFORMANCE INFORMATION IN THE HIGH GAIN APOLLO TO ROLL OUT.

5. TEST DESCRIPTION AND HAZARDS INFORMATION

THIS TEST DOES X DOES NOT CONTAIN HAZARDOUS OPERATIONS.

MONITOR THE OUTPUTS OF THE THREE ACCELEROMETERS, WITH THE PLATFORM +Z PIVOT UP; WITH THE STABILIZED PLATFORM ALIGNMENT TURNED OFF, MEASURE THE DISPLACEMENT OF THE STABILIZED PLATFORM FOR A FIXED PERIOD OF TIME. MOVE THE INERTIAL GIMBAL TO A SET ANGLE IN PITCH. MONITOR THE OUTPUTS OF THE THREE ACCELEROMETERS. MOVE THE INERTIAL GIMBAL TO +X PIVOT UP THEN 45° IN YAW. MONITOR THE OUTPUTS OF THE THREE ACCELEROMETERS. TURN STABILIZED PLATFORM ALIGNMENT OFF AND MEASURE DRIFT OF THE THREE GYROS. MOVE THE INERTIAL GIMBAL BACK TO THE +X PIVOT UP POSITION. MONITOR THE OUTPUT OF THE THREE ACCELEROMETERS. TURN ALIGNMENT OFF AND MEASURE DRIFT OF THE THREE GYROS.

THE ACCELEROMETER DATA OBTAINED IS DRIFT, SCALE FACTOR, AND Y TO X AND Z TO X ORTHOGONALITY AND ACCELEROMETER SIDE BALANCE.

CONFIGURATION: ST-124M FUNCTIONAL TEST COMPLETED. OPTICAL ACCESS TO THE PLATFORM PRISMS IS REQUIRED FOR THIS TEST.

PHASE: N/A

TEST REQUIREMENTS

MSFC: 7921601
0.3.1.1.2.1.1

REV.	DATE	REASON	Contractor Approval	KSC Approval
B	5/7/69	REVISE TEST AND SUPPORT REQUIREMENTS		
A	4/3/69	REVISE BLOCK 15	D.A. Buchanan 4/3/69	

6. CONTRACTOR APPROVAL	7. ORGANIZATION	9. DATE
D.A. Buchanan 7/31/69	IBM - M66	7/31/69
10. KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
W.A. Lee	LV-ECR-11	7/31/69

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
ST-124M STABILIZED PLATFORM DRIFT TEST

2. KSC TEST NUMBER
V-23198

3. EFFECTIVITY
AS REQUIRED

13. LOCATION
VAB

14. COMPUTER PROG. INDENTIFICATION
N/A

15. EST. TEST TIME
8 HOURS ← 8 MEN

16. SUPPORT REQUIREMENTS

RD: 40092

INTERSTAGE: S-IVB STAGE POWER
IU POWER

OFF-COMPLEX: N/A

ON-COMPLEX:

GROUND POWER	GSE MEASURING
TIMING	LCC MEASURING
FLIGHT COMPUTER SYSTEM	HP GAS
DDAS	OIS
RCA 110A COMPUTERS	Q.A.

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

NONE

18. ITEM CONTINUATION

REV. 32

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE: ST-124M GYRO DRIFT TEST

2. KSC TEST NUMBER: V-23220

3. EFFECTIVITY: AS REQUIRED

4. TEST OBJECTIVES

TO MEASURE GYRO DRIFTS

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

(REPLACES IV-23180)

THIS TEST ☐ DOES ☒ DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

WITH STABILIZED PLATFORM ALIGNMENT TURNED OFF, DISPLACEMENT OF PLATFORM AXIS FROM AN INITIAL SPACE FIXED REFERENCE POSITION FOR A CERTAIN TIME PERIOD IS MEASURED.

LABORATORY FUNCTIONAL TEST COMPLETE.

CONFIGURATION: N/A

TEST REQUIREMENTS

MSFC: 7921601 0.3.1.1.2.2 THRU 0.3.1.1.2.3	MSFC: 7916404 0.3.1.1.2.2 THRU 0.3.1.1.2.3

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
A	12-3-73	REVISE BLOCKS 5 AND 16		

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
D. P. Buchanan	IBM - 960	3/11/71
10. NASA KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
	LV-EDC-11	3/11/71

KSC FORM 23-338 (7-67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE: ST-124M GYRO DRIFT TEST

2. KSC TEST NUMBER: V-23220

3. EFFECTIVITY: AS REQUIRED

13. LOCATION: LAB/VAB/1M6

14. COMPUTER PROC. INDENTIFICATION: N/A

15. EST. TEST TIME: 3 MEN -- 8 HR. EACH

16. SUPPORT REQUIREMENTS

INTERSTAGE: NONE

OFF-COMPLEX: NONE

ON-COMPLEX: NONE

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

NONE

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
ST-124M PRISM ALIGNMENT TEST

2. KSC TEST NUMBER
V-23221

3. EFFECTIVITY
AS REQUIRED

4. TEST OBJECTIVES
TO VERIFY PRISM ALIGNMENT

5. TEST DESCRIPTION EQUIPMENT STATUS/CONFIGURATION

THIS TEST [ ] DOES [X] DOES NOT CONTAIN HAZARDOUS OPERATIONS. (REPLACES IV-23186)

DETERMINE THE INERTIAL PRISM'S ORIENTATION WITH RESPECT TO THE Y ACCELEROMETER MEASURING AXIS WITH MANUAL THEODOLITES.

ACCELEROMETER CALIBRATION PROCEDURE COMPLETED.

CONFIGURATION: EQUIPMENT MUST BE IN LABORATORY IN TEST STAND.

PHASE: IA, IB & II

TEST REQUIREMENTS

MSFC: 7921601
0.3.1.1.2.2.THRU
0.3.1.1.2.3

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
A	5/7/74	REVISE TEST AND SUPPORT REQUIREMENTS	5/10/74	

7. CONTRACTOR APPROVAL: C. V. Buchanan
8. ORGANIZATION: IBM - 960
9. DATE: 3/11/71

10. NASA PSD APPROVAL:
11. ORGANIZATION: LV-GDC-72
12. APPROVAL DATE: 3/12/71

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APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
ST-124M PRISM ALIGNMENT TEST

2. KSC TEST NUMBER
V-23221

3. EFFECTIVITY
AS REQUIRED

13. LOCATION
LAB/VAB/1M6

14. COMPUTER PROC. INDENTIFICATION
N/A

15. EST. TEST TIME
4 MEN - 4 HOURS EACH

16. SUPPORT REQUIREMENTS

INTERSTAGE: NONE

OFF-COMPLEX: NONE

ON-COMPLEX: Q.A.

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

NONE

18. ITEM CONTINUATION

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REV 32

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
ST-124M ALIGNMENT SYSTEM PERFORMANCE TEST

2. KSC TEST NUMBER
V-23222

3. EFFECTIVITY
AS REQUIRED

4. TEST OBJECTIVES
TO VERIFY THE PERFORMANCE AND TO ASSURE COMPATIBILITY BETWEEN PLATFORM AND ALIGNMENT SYSTEM.

5. TEST DESCRIPTION EQUIPMENT STATUS/CONFIGURATION

(REPLACES IV-23187)

THIS TEST ( ) DOES (X) DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

EACH GYRO IS TORQUED A NUMBER OF DEGREES AND THE TIME OF RECOVERY IS RECORDED. THE GAINS OF ALL LOOPS IN THE ALIGNMENT SYSTEM ARE ADJUSTED FOR STABILITY IN ALL MODES OF OPERATION. THE INERTIAL PLATFORM IS DRIVEN BY THE SIMULATOR TO AN ANGLE. THE ANGLE IS THEN VERIFIED BY OPTICAL MEASUREMENTS.

CONFIGURATION: EQUIPMENT MUST BE IN A LABORATORY IN TEST STAND

PHASE: IA, IB, & II

TEST REQUIREMENTS

MSFC: 7921601
0.3.1.1.2.1
0.3.1.1.2.1.1
0.3.1.1.2.2 THRU
0.3.1.1.2.2.3

REV.	DATE	REASON	Contractor Approval	KSC Approval
A	5/7/74	REVISE TEST AND SUPPORT REQUIREMENTS	R. [signature] 5/7/74	[signature]

7. CONTRACTOR APPROVAL: C. V. Buchanan
8. ORGANIZATION: IBM - 960
9. DATE: 3/11/71
10. NASA KSC APPROVAL: [signature]
11. ORGANIZATION: LV-GOL-12
12. APPROVAL DATE: 3/12/71

KSC FORM 23-138 (7/67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
ST-124M ALIGNMENT SYSTEM PERFORMANCE TEST

2. KSC TEST NUMBER
V-23222

3. EFFECTIVITY
AS REQUIRED

13. LOCATION
LAB/VAB/1M6

14. COMPUTER PROC. INDENTIFICATION
N/A

15. EST. TEST TIME
4 MEN — 6 HR. EACH

16. SUPPORT REQUIREMENTS

INTERSTAGE: NONE

OFF-COMPLEX: NONE

ON-COMPLEX: Q.A.

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

NONE

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
ST-124/32:1 RESOLVER TEST (STANDBY)

2. KSC TEST NUMBER
V-23223

3. EFFECTIVITY
AS REQUIRED

4. TEST OBJECTIVES

TO VERIFY 32:1 RESOLVER OUTPUTS; SCALE FACTORS AND NULLS.

5. TEST DESCRIPTION EQUIPMENT STATUS/CONFIGURATION (REPLACES IV-23175)

THIS TEST ☐ DOES ☒ DOES NOT CONTAIN HAZARDOUS OPERATIONS.

SIMULATE VEHICLE MOVEMENT WITH THE TEST STAND AND RECORD GIMBAL ANGLE READOUTS.

CONFIGURATION: N/A

TEST REQUIREMENTS

MSFC: 7921601
0.3.1.1.2.2.3

PHASE 1A, 1B, & II

6. REV	DATE	REASON	Contractor Approval	KSC Approval
A	5/7/74	REVISE TEST AND SUPPORT REQUIREMENTS		

7. CONTRACTOR APPROVAL
R. V. Richardson

8. ORGANIZATION
IBM - 960

9. DATE
4/30/71

10. NASA/KSC APPROVAL

11. ORGANIZATION
LV-SPEC-1

12. APPROVAL DATE
5/4/71

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
ST-124/32:1 RESOLVER TEST (STANDBY)

2. KSC TEST NUMBER
V-23223

3. EFFECTIVITY
AS REQUIRED

13. LOCATION
LAB-VAB-1M6

14. COMPUTER PROC. INDENTIFICATION
N/A

15. EST. TEST TIME
4 MEN - 4.0 HOURS

16. SUPPORT REQUIREMENTS

INTERSTAGE: NONE

OFF-COMPLEX: NONE

ON-COMPLEX: Q.A.

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

NONE

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
ST-124M STABILIZED PLATFORM SYSTEM PRELIMINARY OPERATIONS FOR LABORATORY TESTING (STANDBY)

2. KSC TEST NUMBER
V-23224

3. EFFECTIVITY
AS REQUIRED

4. TEST OBJECTIVES

TO PERFORM RECEIVING INSPECTION AND TO PREPARE THE SYSTEM FOR ELECTRICAL TESTING.

5. TEST DESCRIPTION/EQUIPMENT STATUS/CONFIGURATION (REPLACES IV-23176)

THIS TEST ☐ DOES ☒ DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

UNPACK EQUIPMENT AND PERFORM EXTERNAL AND INTERNAL INSPECTIONS. INSTALL IN TEST STAND. CONNECT PNEUMATIC LINE TO PLATFORM AND ADJUST PRESSURE TO MEET PLATFORM REQUIREMENTS. CONNECT THE TEST CONSOLE CABLES AND INTERCONNECTING SYSTEM CABLES. PERFORM COOLANT SYSTEM CONTAMINATION CHECKS AND PREPARE FOR OPERATIONS.

UNDER NORMAL CONDITIONS, THE COVER WILL NOT BE REMOVED.

GN2 SUPPLY TO PLATFORM WITHIN PROPER PURITY SPECIFICATIONS. LABORATORY AREA CLEANED AND PREPARED FOR RECEIVING THE ST-124M STABILIZED PLATFORM SYSTEM.

CONFIGURATION: N/A

TEST REQUIREMENTS

MSFC: N/A

6. REV.	DATE	REASON	Contractor Approval	KSC Approval

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
D. T. Buchanan	IBM - 960	4/30/71
10. NASA-KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
C. M. L. Pitts	LV-GCC-11	5/4/71

KSC FORM 23-338 (7/67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
ST-124M STABILIZED PLATFORM SYSTEM PRELIMINARY OPERATIONS FOR LABORATORY TESTING (STANDBY)

2. KSC TEST NUMBER
V-23224

3. EFFECTIVITY
AS REQUIRED

13. LOCATION	14. COMPUTER PROG. INDENTIFICATION	15. EST. TEST TIME
LAB-VAB-1M6	N/A	4 MEN - 4.0 HOURS

16. SUPPORT REQUIREMENTS

INTERSTAGE: NONE

OFF COMPLEX: NONE

ON COMPLEX: Q.I.

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

NONE

18. ITEM CONTINUATION

11C

REV 32

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE: LABORATORY PNEUMATIC TEST OF THE ST-124M STABILIZED PLATFORM SYSTEM (STANDBY)

2. KSC TEST NUMBER: V-23225

3. EFFECTIVITY: AS REQUIRED

4. TEST OBJECTIVES

A. TO VERIFY THAT THE STABILIZED PLATFORM PNEUMATIC PERFORMANCE IS WITHIN SPECIFIED FLOW AND PRESSURE TOLERANCES DURING SIMULATED FLIGHT CONDITIONS.
B. TO CALIBRATE THE INTERNAL AMBIENT PRESSURE TRANSDUCER.
C. TO DETERMINE PLATFORM; PEA, ASC, AND AC POWER SUPPLY LEAK RATE.
D. TO VERIFY THAT THE PLATFORM PURGE SYSTEM PERFORMANCE IS WITHIN SPECIFIED FLOW AND PRESSURE TOLERANCES.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION (REPLACES IV-23177)

THIS TEST ___ DOES X DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

A. ENERGIZE ELECTRICAL, PNEUMATIC, AND COOLING GSE AND ALLOW PLATFORM TO REACH OPERATING TEMPERATURE. REGULATE INLET GAS SUPPLY PRESSURE THROUGHOUT TEST TO MAINTAIN A PRESCRIBED DIFFERENTIAL PRESSURE WITH REFERENCE TO INTERNAL AMBIENT PRESSURE. APPLY A VACUUM AT THE ORIFICE TO SIMULATE EXTERNAL AMBIENT PRESSURE CONDITIONS AFTER LIFTOFF. RECORD INLET, INTERNAL AMBIENT, DIFFERENTIAL, AND EXTERNAL AMBIENT PRESSURE VALUES, AND FLOW IN S.L./MIN.

B. ADJUST THE INTERNAL AMBIENT PRESSURE AND CHECK THE INTERNAL AMBIENT PRESSURE TRANSDUCER THROUGHOUT ITS OPERATING RANGE.

C. PRESSURIZE PLATFORM AND ASSOCIATED EQUIPMENT, AND CHECK FOR LEAKS.

D. ADJUST THE PURGE ORIFICE INLET PRESSURE WITHIN A SPECIFIED RANGE UNTIL THE INTERNAL AMBIENT PRESSURE AND PURGE ORIFICE FLOW RATE FALL WITHIN PRESCRIBED LIMITS. RECORD VALUES.

ELECTRICAL, PNEUMATIC AND COOLING GSE CONNECTED. NO SUPPORT REQUIRED.

CONFIGURATION: N/A

TEST REQUIREMENTS

MSFC: 7921601
0.3.1.1.2.2
THRU
0.3.1.1.2.2.3

PHASE IA, IB & II

6. REV	DATE	REASON	Contractor Approval	KSC Approval
A	5/7/74	REVISE TEST AND SUPPORT REQUIREMENTS	[signature] 5/7/74	[signature]

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
[signature] Buchanan	IBM - 960	4/30/71
10. NASA-KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
[signature]	LV-GOC-11	5/4/71

KSC FORM 21-339

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE: LABORATORY PNEUMATIC TESTS OF THE ST-124M STABILIZED PLATFORM SYSTEM (STANDBY)

2. KSC TEST NUMBER: V-23225

3. EFFECTIVITY: AS REQUIRED

13. LOCATION: LAV-VAB-1M6

14. COMPUTER PROC. INDENTIFICATION: N/A

15. EST. TEST TIME: 4 MEN - 24.0 HOURS

16. SUPPORT REQUIREMENTS

INTERSTAGE: NONE

OFF-COMPLEX: NONE

ON-COMPLEX: Q.A.

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

ST-124M STABILIZED PLATFORM SYSTEM PRELIMINARY OPERATIONS FOR LAB TESTING.

18. ITEM CONTINUATION

REV 32

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
FUNCTIONAL TEST OF THE ST-124M STABILIZED PLATFORM SYSTEM IN THE LABORATORY (STANDBY)

2. KSC TEST NUMBER
V-23226

3. EFFECTIVITY
AS REQUIRED

4. TEST OBJECTIVES
TO APPLY POWER TO THE STABILIZED PLATFORM SYSTEM AND VERIFY SATISFACTORY FUNCTIONAL PERFORMANCE.

5. TEST DESCRIPTION EQUIPMENT STATUS/CONFIGURATION

(REPLACES IV-23179)

THIS TEST __ DOES X DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

APPLY POWER TO THE TEST CONSOLE. APPLY POWER TO THE STABILIZED PLATFORM SYSTEM. OBSERVE ALL METERS AND RECORDERS FOR NORMAL INDICATIONS. VERIFY THAT EACH SWITCH OPERATION PERFORMS ITS FUNCTION SATISFACTORILY.

PLATFORM SYSTEM PREPARATION FOR LABORATORY TEST COMPLETED.

CONFIGURATION: N/A

TEST REQUIREMENTS

MSFC: 7921601
0.3.1.1.2.2
THRU
0.3.1.1.2.2.3

PHASES IA, IB AND II

4. REV.	DATE	REASON	Contractor Approval	KSC Approval
A	5/7/74	REVISE TEST AND SUPPORT REQUIREMENTS	[signature] 5/9/74	[signature]

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
[signature]	IBM - 960	4/30/71
10. NASA KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
[signature]	LV-COC-11	5/4/71

KSC FORM 21-336 7-67

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
FUNCTIONAL TEST THE ST-124M STABILIZED PLATFORM SYSTEM IN THE LABORATORY (STANDBY)

2. KSC TEST NUMBER
V-23226

3. EFFECTIVITY
AS REQUIRED

13. LOCATION
LAB-VAB-1M6

14. COMPUTER PROC. INDENTIFICATION
N/A

15. EST. TEST TIME
4 MEN - 5.0 HOURS

16. SUPPORT REQUIREMENTS

INTERSTAGE: NONE

OFF-COMPLEX: NONE

ON-COMPLEX: Q.A.

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

NONE

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
VALIDATION PROCEDURE - ST-124M MOUNTING SURFACE ALIGNMENT TEST FIXTURE (STANDBY)

2. KSC TEST NUMBER
V-23227

3. EFFECTIVITY
AS REQUIRED

4. TEST OBJECTIVES

TO VERIFY THAT THE GEOMETRIC CONFIGURATION OF THE ST-124M MOUNTING SURFACE ALIGNMENT TEST FIXTURE IS WITHIN GIVEN TOLERANCES AS SPECIFIED.

5. TEST DESCRIPTION/EQUIPMENT STATUS/CONFIGURATION

(REPLACES IV-23181)

THIS TEST ☐ DOES ☒ DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

VERIFY THAT THE FIXTURE IS VERTICAL WHEN ON VERTICAL MOUNTS. VERIFY THAT THE PRISM IS AT A CORRECT AZIMUTH ANGLE WITH RESPECT TO ITS MOUNTING SURFACES.

LABORATORY CHECKOUT

TURN-TILT STAND SHOULD BE VALIDATED WITHIN 30 DAYS PRIOR TO PERFORMING THIS PROCEDURE.

CONFIGURATION: N/A

TEST REQUIREMENTS

MSFC: N/A

6. REV.	DATE	REASON	Contractor Approval	KSC Approval

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
D. P. Patterson	IBM - 960	4/30/71
10. NASA-KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
L. Ball	LV-GOC-12	5/3/71

KSC FORM 8 17/67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
VALIDATION PROCEDURE - ST-124M MOUNTING SURFACE ALIGNMENT TEST FIXTURE (STANDBY)

2. KSC TEST NUMBER
V-23227

3. EFFECTIVITY
AS REQUIRED

13. LOCATION	14. COMPUTER PROC. INDENTIFICATION	15. EST. TEST TIME
LAB-VAB-1M6	N/A	3 MEN - 2.5 HOURS

16. SUPPORT REQUIREMENTS

INTERSTAGE: NONE

OFF COMPLEX: NONE

ON COMPLEX: Q.I.

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

NONE

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
READINESS CHECKS OF S-IB FLIGHT CONTROL TEST EQUIPMENT

2. KSC TEST NUMBER
V-23259

3. EFFECTIVITY
206 & Subs

4. TEST OBJECTIVES

TO VERIFY THAT THE S-IB FLIGHT CONTROL TEST EQUIPMENT IS READY TO SUPPORT LABORATORY AND/OR S-IB STAGE FLIGHT CONTROL SYSTEM CHECKOUT.

5. TEST DESCRIPTION EQUIPMENT STATUS/CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT CONTAIN HAZARDOUS OPERATIONS.

1. Readiness checks will be performed on the following S-IB Flight Control Equipment:
   a. S-IB Interrupt Boxes
   b. S-IB Actuator Calibration and Measuring Fixture
   c. S-IB Portable Substitute Computers
   d. S-IB Hydraulic Servicer
   e. S-IB Actuator Test Boxes
   f. S-IB Actuator Dummy Loads
2. Tests will be conducted per each vehicle in the Flight Control Laboratory prior to S-IB Flight Control System checkout.

CONFIGURATION: LABORATORY TESTS.

TEST REQUIREMENTS:
MSFC - N/A

REV	DATE	REASON	Contractor Approval	KSC Approval
B	2-23-73	To delineate checkout of additional equip	T.W. Brown	D.W. Ely, 2-27-73
A	6-19-72	To comply with TI-2-17, Rev. F	T.W. Brown	D.W. Ely, 6-27-72

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
D. Stewart/W. O. Brown	CCSD	10-11-71
10. NASA/KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
George W. Ely	LV-GDC-33	10/20/71

KSC FORM 23-338 (* 67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
READINESS CHECKS OF S-IB FLIGHT CONTROL TEST EQUIPMENT

2. KSC TEST NUMBER
V-23259

3. EFFECTIVITY
206 & Subs

13. LOCATION
F. C. Lab VAB

14. COMPUTER PROC. INDENTIFICATION
N/A

15. EST. TEST TIME
8.0 Hours

16. SUPPORT REQUIREMENTS

NONE

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

NONE

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1 TEST TITLE
VISUAL INSPECTION AND FUNCTIONAL TEST OF SPARE S-IB HYDRAULIC ACTUATORS IN LABORATORY

2 KSC TEST NUMBER
V-23260

3 EFFECTIVITY
206 & SUBS

4 TEST OBJECTIVES

TO VISUALLY INSPECT AND FUNCTIONALLY TEST THE SPARE S-IB HYDRAULIC ACTUATOR IN THE FLIGHT CONTROL LAB TO VERIFY THAT NO DAMAGE HAD OCCURRED DURING SHIPMENT.

5 TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT CONTAIN HAZARDOUS OPERATIONS.

The Actuator will be visually inspected for physical damage, serial numbers shall be recorded.

Resistance, electrical noise, and electro-mechanical alignment tests will be conducted utilizing the S-IB actuator test box assembly and the actuator calibration and measuring fixture.

CONFIGURATION: LABORATORY TEST

TEST REQUIREMENTS:
MSFC - N/A

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
A	6/4/74	REVISE EFFECTIVITY	W. O. Brown	H. W. Ely

7. APPROVAL	8. ORGANIZATION	9. DATE
D. Oberlin/W. O. Brown	CCSD	10-4-71
10. NASA-KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
George W. Ely	LV-GDC-33	10/20/71

KSC FORM 23-536 (5)

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1 TEST TITLE
VISUAL INSPECTION AND FUNCTIONAL TEST OF SPARE S-IB HYDRAULIC ACTUATORS IN LABORATORY

2 KSC TEST NUMBER
V-23260

3 EFFECTIVITY
206 & SUBS

13 LOCATION
F/C Lab - VAB

14 COMPUTER PROG. IDENTIFICATION
N/A

15 EST TEST TIME
3.0 Hours

16 SUPPORT REQUIREMENTS

NONE

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

NONE

18. ITEM CONTINUATION

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REV 32

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1 TEST TITLE
S-IB HYDRAULIC ACTUATOR POTENTIOMETER LAB INSPECTION AND CHECKOUT

2 KSC TEST NUMBER
V-23261

3 EFFECTIVITY
206 & SUBS

4 TEST OBJECTIVES

TO VISUALLY INSPECT AND FUNCTIONALLY TEST THE SPARE S-IB HYDRAULIC ACTUATOR POTENTIOMETER.

5 TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST ( ) DOES (X) DOES NOT CONTAIN HAZARDOUS OPERATIONS.

1. The potentiometer will be visually inspected for damage and serial numbers will be recorded.
2. Resistance, electro-mechanical alignment, and potentiometer electrical noise tests will be conducted.
3. The S-IB actuator test box and the actuator calibration and measuring fixture will be used in this test.

CONFIGURATION: LABORATORY TEST.

TEST REQUIREMENTS:
MSFC - LVTOM1-548-67-CCSD-147

REVISION EFFECTIVITY			
1	2-23-73	Potentiometer mating with extension shaft deleted from this procedure.	Contractor Approval: [signature] KSC Approval: [signature]
REV.	DATE	REASON	

7. NASA TECH APPROVAL	8. ORGANIZATION	9. DATE
D. Dutton/W.O. Brown	CCSD	10-4-71
10. NASA APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
George W. Ely	LV-GDC-33	10/20/71

KSC FORM 21-538 (7-67)

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1 TEST TITLE
S-IB HYDRAULIC ACTUATOR POTENTIOMETER LAB INSPECTION AND CHECKOUT

2 KSC TEST NUMBER
V-23261

3 EFFECTIVITY
206 & SUBS

13 LOCATION
FC LAB, VAB

14 COMPUTER PROC. INDENTIFICATION
N/A

15 EST TEST TIME
2 Hours

16 SUPPORT REQUIREMENTS

NONE

17 OTHER APPLICABLE REFERENCE DOCUMENTATION

NONE

18 ITEM CONTINUATION

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
S-IB FLIGHT CONTROL POST ERECTION OPERATIONS

2. KSC TEST NUMBER
V-23262

3. EFFECTIVITY
206 & SUBS

4. TEST OBJECTIVES

TO VERIFY NO SHIPPING ANOMALIES AND TO INSTALL PROTECTIVE NON-FLIGHT HARDWARE.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST ___ DOES X DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

1. A visual inspection is made of all hydraulic actuator assemblies in order to uncover any shipping anomalies.
2. Actuator protective cable guards are installed on all eight S-IB actuators.
3. Actuator position indicator scales are installed on all eight S-IB actuators.
4. All non-flight hardware will be identified.

CONFIGURATION: N/A

TEST REQUIREMENTS:
MSFC - N/A

6. REV. DATE	REVISED EFFECTIVITY REASON	Contractor Approval	KSC Approval
6-4-74			

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
D. Stewart/W. O. Brown	CCSD	10-4-71
10. NASA-KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
George W. Ely	LV-GDC-33	10/20/71

KSC FORM 21-339 (7/67)

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
S-IB FLIGHT CONTROL POST ERECTION OPERATIONS

2. KSC TEST NUMBER
V-23262

3. EFFECTIVITY
206 & SUBS

13. LOCATION
VAB - HB #1

14. COMPUTER PROG. IDENTIFICATION
N/A

15. EST. TEST TIME
2.0 Hours

16. FLIGHT REQUIREMENTS

NONE

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

NONE

18. ITEM CONTINUATION

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REV 32

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1 TEST TITLE
INSTALLATION AND REMOVAL OF S-IB ACTUATOR HOLDING FIXTURES

2 KSC TEST NUMBER
V-23263

3 EFFECTIVITY
206 & SUBS

4 TEST OBJECTIVES

TO PROVIDE FOR DISCONNECTION AND RECONNECTION OF THE S-IB HYDRAULIC ACTUATORS FROM THE THRUST STRUCTURE.

5 TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST ___ DOES X DOES NOT CONTAIN HAZARDOUS OPERATIONS.

1. Holding fixtures are installed on all eight (8) S-IB Hydraulic Actuators to provide support and clearance between the actuators and nearby vehicle components.
2. Identify holding fixtures as non-flight hardware.
3. Holding fixtures are removed and the actuators are reconnected to the vehicle airframe.

CONFIGURATION: N/A

TEST REQUIREMENTS:
MSFC - N/A

6 REV.	DATE	REASON	Contractor Approval	KSC Approval
	6 X 24	REVISE EFFECTIVITY		

7 CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
D. Daddow/W. O. Brown	CCSD	10-4-71
10 NASA-KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
George W. Ely	LV-GDC-33	10/20/71

KSC FORM 21-338 7/67

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1 TEST TITLE
INSTALLATION AND REMOVAL OF S-IB ACTUATOR HOLDING FIXTURES

2 KSC TEST NUMBER
V-23263

3 EFFECTIVITY
206 & SUBS

13 LOCATION	14 COMPUTER PROG. IDENTIFICATION	15 EST. TEST TIME
LC-39	N/A	2.0 Hours

16 SUPPORT REQUIREMENTS

S-IB Vehicle Mechanical

17 OTHER APPLICABLE REFERENCE DOCUMENTATION

NONE

18 ITEM CONTINUATION

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1 TEST TITLE
S-IB HYDRAULIC ACTUATOR VISUAL INSPECTION AND ELECTRO-MECHANICAL STATIC TEST

2 KSC TEST NUMBER
V-23264

3 EFFECTIVITY
206 & SUBS

4 TEST OBJECTIVES

TO PERFORM A VISUAL INSPECTION AND FUNCTIONAL TEST ON EACH OF THE EIGHT (8) HYDRAULIC ACTUATORS ON THE S-IB STAGE.

5 TEST PERFORMED ON EQUIPMENT STATUS CONFIGURATION

THIS TEST DOES X DOES NOT CONTAIN HAZARDOUS OPERATIONS.

1. The actuators must be mechanically disconnected from the thrust frame for this test.
2. A complete visual inspection will be conducted on all eight (8) hydraulic actuator assemblies and all significant data (Ser. No., Cure Date, etc.) recorded.
3. An electro-mechanical alignment, a resistance test on both potentiometers and servo valve, and a potentiometer electrical noise test is then conducted utilizing the S-IB actuator test box.

CONFIGURATION: Vehicle in vertical position.

TEST REQUIREMENTS:
MSFC - 3.1.2.1
3.1.2.3
3.1.2.5

6 REV.	DATE	REASON	Contractor Approval	KSC Approval
A	10-4-71	MINOR EFFECTIVITY		

7 CONTRACTOR APPROVAL	8 ORGANIZATION	9 DATE
A. Petro W.O. Brown	CCSD	10-4-71
10 NASA-KSC APPROVAL	11 ORGANIZATION	12. APPROVAL DATE
George W. Ely	LV-GDC-13	10/20/71

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1 TEST TITLE
S-IB HYDRAULIC ACTUATOR VISUAL INSPECTION AND ELECTRO-MECHANICAL STATIC TEST

2 KSC TEST NUMBER
V-23264

3 EFFECTIVITY
206 & SUBS

13 LOCATION
H. B. #1. VAB

14 COMPUTER PROG. IDENTIFICATION
N/A

15 EST. TEST TIME
8.0 Hours

16 SUPPORT REQUIREMENTS

VEHICLE MECHANICAL (AS REQUIRED)

17 OTHER APPLICABLE REFERENCE DOCUMENTATION

NONE

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
FUNCTIONAL TEST AND CALIBRATION OF S-IB LCC FLIGHT CONTROL SUPPORT EQUIPMENT

2. KSC TEST NUMBER
V-23265

3. EFFECTIVITY
As Required

4 TEST OBJECTIVES

TO VERIFY THE TEST READINESS OF LCC ELECTRICAL SUPPORT EQUIPMENT NECESSARY FOR FLIGHT CONTROL SYSTEMS CHECKOUT AND LAUNCH.

5 TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT CONTAIN HAZARDOUS OPERATIONS.

1. The following panels are functionally tested and/or calibrated, using vehicle or DDAS substitute signal.
   a. S-IB engine deflection panel
   b. S-IB Hydraulic Control & Monitor Panel
   c. LCC Actuator Delta I & Position Recorders
   d. Flight Control Display & Control Console
2. This test normally will be accomplished prior to operations testing of vehicle flight control systems.

CONFIGURATION: LCC DDAS must be operational.

TEST REQUIREMENTS:
MSFC - N/A

6 REV.	DATE	REASON	Contractor Approval	KSC Approval
A	6-19-72	To comply with TI-2-17, Rev. F		

7 CONTRACTOR APPROVAL	8 ORGANIZATION	9. DATE
D. Stewart/W. O. Brown	CCSD	10-4-71
10 NASA KSC APPROVAL 10-20-71 George W. Ely	11. ORGANIZATION LV-GDC-33	12. APPROVAL DATE 10/20/71

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
FUNCTIONAL TEST AND CALIBRATION OF S-IB LCC FLIGHT CONTROL SUPPORT EQUIPMENT

2. KSC TEST NUMBER
V-23265

3. EFFECTIVITY
As Required

13. LOCATION	14. COMPUTER PROC. INDENTIFICATION	15. EST. TEST TIME
LCC - FR #3	N/A	4.0 Hours

16. SUPPORT REQUIREMENTS

1. Ground Power
2. DDAS
3. RCA-110A

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

NONE

18. ITEM CONTINUATION

120

REV 32

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1 TEST TITLE
S-IB STAGE HYDRAULIC ACTUATOR SYSTEM FUNCTIONAL TEST

2 KSC TEST NUMBER
V-23266

3 EFFECTIVITY
206 & SUBS

4 TEST OBJECTIVES

1. To functionally test the complete S-IB hydraulic actuator system and its associated equipment.

2. To test the S-IB flight control system in normal flight configuration.

5 TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT CONTAIN HAZARDOUS OPERATIONS.

This test is conducted in two parts.
Part I - Single System Operation
Part II - All Systems - On Operation

Part I - Single System Operation
Each individual hydraulic system is activated, and visually inspected for leaks or erratic operation. The actuators are then cycled and nulled using the S-IB substitute computer.

Part II - All Systems Operation
All hydraulic systems are activated. The S-IB system nulls are read at ambient temp. and at approximately 150°F. The SIB actuators will be cycled at approximatelv 100°F. Hydraulic systems are inspected for leaks and erratic operation.

A visual inspection is performed before, during, and after each of the above tests.

CONFIGURATION: Vehicle in vertical position after Power On.

TEST REQUIREMENTS
MSFC - 3.1.1.2.2.]
3.1.2.4
3.1.2.7

3 CURRENT REVISL EFFECTIVITY			
A	7-11-73 To change Part II of Test Description	[signature]	[signature] 7-11-73
4 REV	DATE	REASON	Contractor Approval	KSC Approval

7 CONTRACTOR APPROVAL	8 ORGANIZATION	9. DATE
[signature] S&B A. Petro W.O. Brown	CCSD	10-4-71
10 NASA/KSC APPROVAL [signature] 10-20-71 George W. Ely	11. ORGANIZATION LV-GDC-37	12. APPROVAL DATE 10/20/71

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1 TEST TITLE
S-IB STAGE HYDRAULIC ACTUATOR SYSTEM FUNCTIONAL TEST

2 KSC TEST NUMBER
V-23266

3 EFFECTIVITY
206 & SUBS

13 LOCATION	14 COMPUTER PROG. IDENTIFICATION	15 EST. TEST TIME
H. B. #1, VAB	OAHF	4.0 Hours

16 SUPPORT REQUIREMENTS

S-IB Vehicle Mechanical
S-IB Blockhouse Measuring
I. U. Flight Control
D. D. A. S. Blockhouse

17 OTHER APPLICABLE REFERENCE DOCUMENTATION

NONE

18 ITEM CONTINUATION

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REV 32

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
S-IB HYDRAULIC ACTUATOR POSITION MEASURING CALIBRATION

2. KSC TEST NUMBER
V-23267

3. EFFECTIVITY
206 & SUBS

4. TEST PURPOSES

To calibrate the S-IB engine deflection meters and the Flight Control Firing Room recorders.

To verify actuator measuring potentiometer calibration curves.

To obtain data point inputs for computer programs.

5. DESCRIPTION OF EQUIPMENT STATUS CONFIGURATION

THIS TEST ☐ DOES X DOES NOT CONTAIN HAZARDOUS OPERATIONS.

Move the S-IB Hydraulic Actuators to discrete positions and adjust the S-IB engine deflection meters and the Flight Control Firing Room recorders to indicate proper positions.

Verify with measuring that the measuring voltage associated with a particular position falls within the tolerance range of the actuator calibration curves.

The following procedures/tests must be completed prior to performing this task:

1. Functional Test and Calibration of S-IB Firing Room Flight Control Support Equipment.
2. S-IB Flight Control Pre-Operational and Securing Procedure.
3. S-IB Hydraulic Actuator Visual Inspection and Electro-Mechanical Static Test.

CONFIGURATION: Vehicle Vertical and Mated

TEST REQUIREMENTS:
MSFC: N/A

A 1 1 24 MINOR EFFECTIVITY

6. REV. DATE	REASON	Contractor Approval	KSC Approval

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
D. Daddow/W. O. Brown	CCSD	10-5-71
10. NASA-KSC APPROVAL 10-26-71 George W. Ely 10/26/71	11. ORGANIZATION LV-CDC-33	12. APPROVAL DATE 10/20/71

KSC FORM 23-338 (7-67)

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
S-IB HYDRAULIC ACTUATOR POSITION MEASURING CALIBRATION

2. KSC TEST NUMBER
V-23267

3. EFFECTIVITY
206 & SUBS

13. LOCATION
FR #3, HB-1

14. COMPUTER PROC IDENTIFICATION
OAAC

15. EST TEST TIME
12 Hours

16. SUPPORT REQUIREMENTS

GROUND POWER
SATURN GROUND COMPUTER COMPLEX
IU MEASURING
IU DDAS

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

NONE

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1 TEST TITLE
S-IB STAGE ACTUATOR POSITION CALIBRATION DATA LOAD

2 KSC TEST NUMBER
V-23268

3 EFFECTIVITY
206 & SUBS

4 TEST OBJECTIVES

PROVIDE S-IB STAGE ACTUATOR POSITION CALIBRATION DATA FOR PROGRAMS CTB1, CTB6, and CTB7.

5 TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST DOES X DOES NOT CONTAIN HAZARDOUS OPERATIONS.

1. Load the magnetic tape with data from 80 card column cards which has the actuator positional information.
2. Verify that the correct identification is on the effective tape.
3. Edit the calibration tape or "key in" corrected calibration data when processing data from a single actuator or when correcting otherwise invalid data.
4. This operation will be performed off line.

CONFIGURATION: N/A

TEST REQUIREMENTS:
MSFC: N/A

6 REV DATE	REVISED EFFECTIVITY REASON	Contractor Approval	KSC Approval

7 CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
D. Daddow/W. O. Brown	CCSD	10-5-71
10 NASA KSC APPROVAL DD's 10-20-71	11. ORGANIZATION	12. APPROVAL DATE
10/20/71	LV-GDC-33	10/20/71

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1 TEST TITLE
S-IB STAGE ACTUATOR POSITION CALIBRATION DATA LOAD

2 KSC TEST NUMBER
V-23268

3 EFFECTIVITY
206 & SUBS

13 LOCATION
FR#3 & HB-1

14 COMPUTER PROG IDENTIFICATION
CTB8

15 EST TEST TIME
4.0 Hours

16 SUPPORT REQUIREMENTS

1. Saturn Ground Computer Complex

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

NONE

18. ITEM CONTINUATION

123

REV 32

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

S-IB ACTUATOR DIFFERENTIAL PRESSURE FEEDBACK AND ACTUATOR STICTION TEST

KSC TEST NUMBER: V-23269

EFFECTIVITY: 206 & SUBS

TEST OBJECTIVES

TO CONFIRM THE PROPER FUNCTIONING OF THE SERVO VALVES ON THE S-IB ACTUATORS.

TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST ___ DOES X DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

1. A step input equivalent to 1.5 degrees of actuator movement is applied to the actuator servo valves to verify proper operation of the differential pressure feedback (DPF) Loop.
2. A Sinusoidal input of 0.1 Hz at ± 0.1° is applied to the actuator servo valves to verify proper operation of the servo valves and no contamination of the hydraulic fluid.
3. The input signals are provided by the S-IB substitute computer.
4. The actuator hydraulic system will provide power for actuator response.
5. Actuator responses monitored on a portable recorder will be used for test evaluation.

CONFIGURATION: The actuators are mechanically connected in flight configuration.

TEST REQUIREMENTS:
MSFC - 3.1.2.2
3.1.2.6

EFF. DATE	REASON	Contractor Approval	KSC Approval
	INITIAL EFFECTIVITY	C. T. Brown	H. W. Ely

CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
D. Stewart W. O. Brown	CCSD	10-4-71
NASA APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
Hugh W. Ely	LV-GDC-33	10/20/71

KSC FORM 23-138 (7-67)

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
S-IB ACTUATOR DIFFERENTIAL PRESSURE FEEDBACK AND ACTUATOR STICTION TEST

2. KSC TEST NUMBER: V-23269

3. EFFECTIVITY: 206 & SUBS

13. LOCATION: LC-39

14. COMPUTER PROG IDENTIFICATION: OAGS

15. EST TEST TIME: 4.0 Hours

16. SUPPORT REQUIREMENTS

1. RCA-110A
2. S-IB Power
3. LCC Measuring (LVO)
4. DDAS
5. S-IB Vehicle Mechanical

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

NONE

18. ITEM CONTINUATION

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KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
S-IB STAGE HYDRAULIC SYSTEM OPERATION
STANDBY

2. KSC TEST NUMBER
V-23270

3. EFFECTIVITY
As Required

4. TEST OBJECTIVES

PROVIDE HYDRAULIC SYSTEM OPERATION UTILIZING THE S-IB SUBSTITUTE COMPUTER IN SUPPORT OF OTHER TEST OPERATIONS REQUIRING HYDRAULICS.

5. TEST DESCRIPTION, EQUIPMENT STATUS/CONFIGURATION

THIS TEST [X] DOES [ ] DOES NOT CONTAIN HAZARDOUS OPERATIONS.

1. Connect the S-IB Substitute Computer to an S-IB Hydraulic Actuator System.
2. Apply Hydraulic Pressure to the Actuator System.
3. Visually inspect the Hydraulic Actuator System for leaks or erratic operation.
4. Operate S-IB Hydraulic System as required.

CONFIGURATION: VEHICLE IN VERTICAL POSITION, POWER ON.

TEST REQUIREMENTS:
MSFC - 3.1.1.1.1 THROUGH 3.1.1.1.4
3.1.2.7

REV.	DATE	REASON	Contractor Approval	KSC Approval
C	3-28-73	Delete Item 5, Block 5, & change BH Meas. to LCC Meas.		
B	3-28-73	Change to Hazardous Opns. under certain conditions		
A	1/23/73	TO REFLECT COMPLETE MSFC TEST REQUIREMENT 3.1.1.1.1 THROUGH 3.1.1.1.4		

6. CONTRACTOR APPROVAL
D. Daddow/W. O. Brown

7. ORGANIZATION
CCSD

8. DATE
10-4-71

9. NASA KSC APPROVAL

10. ORGANIZATION
LV-GDC-33

11. APPROVAL DATE
10-20-71

KSC FORM 3 [illegible]

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
S-IB STAGE HYDRAULIC SYSTEM OPERATION
STANDBY

2. KSC TEST NUMBER
V-23270

3. EFFECTIVITY
As Required

12. LOCATION
LCC 39

14. COMPUTER PROG. IDENTIFICATION
OAGS - General Support Program

15. EST. TEST TIME
1.0 Hour

16. SUPPORT REQUIREMENTS

S-IB Vehicle Mechanical
LCC Measuring
DDAS
RCA-110A Ground Computer System
S-IB Ground Networks

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

1. S-IB Flight Control Pre-Operational & Securing Proc.
2. Actuator, Thrust Vector Control, Specification for 10M01033.

18. ITEM CONTINUATION

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REV 32

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE: MATING AND ALIGNMENT OF SIB STAGE TO LAUNCHER

2. KSC TEST NUMBER: V-23275

3. EFFECTIVITY: 206 & SUBS

4. TEST OBJECTIVES

The objective of this operation is to set each of the eight launcher nose blocks to form an elevation pattern which will minimize loading differentials between the eight leg/strut members which support the stage on the launcher.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST DOES X DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

1. After the stage has been erected, launcher nose block shall be adjusted as required to cause datum plane "A" reference points to fall in plane. The reference points are monitored optically when launcher adjustments are made. The elevation pattern of all points is verified to be within acceptable limits after the initial four fins have been engaged with the launcher, and again after all eight fins have been engaged.

2. Adjustable platform inserts shall not be in contact with any stage during initial setting of the nose blocks at fin positions 2, 4, 6 and 8.

CONFIGURATION: Stage erected and resting on four of its support points. SIVB and/or IU may or may not be stacked.

TEST REQUIREMENTS:
MSFC - 3.4.0.2

REV	DATE	REASON	Contractor Approval	KSC Approval
A	6-4-?	LIMIT EFFECTIVITY	[signature]	G. W. Ely

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
D. Oberlin / W. O. Brown	CCSD	10-4-71
10. NASA/KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
[signature]	LV-GSE-2	10/5/71

KSC FORM 23-31 (7/67)

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE: MATING AND ALIGNMENT OF SIB STAGE TO LAUNCHER

2. KSC TEST NUMBER: V-23275

3. EFFECTIVITY: 206 & SUBS

13. LOCATION: Launcher Pad. - VAB

14. COMPUTER PROC. IDENTIFICATION: N/A

15. EST TEST TIME: 8.0 Hours

16. SUPPORT REQUIREMENTS

1. SIB vehicle mechanical personnel to open SIB adjust able inserts.
2. SIVB vehicle mechanical personnel to open SIVB adjust able inserts. (If SIVB and/or IU is stacked)
3. GSE mechanical personnel to adjust nose blocks.
4. IBM PERSONNEL TO OPERATE OPTICAL INSTRUMENTS.

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

NONE

18. ITEM CONTINUATION

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REV 32

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1 TEST TITLE
MEASURE SATURN IB STAGE ALIGNMENT

2 KSC TEST NUMBER
V-23276

3 EFFECTIVITY
206 & SUBS

4 TEST OBJECTIVES

VERIFY SIB STAGE ALIGNMENT WITH RESPECT TO LOCAL GRAVITY VECTOR.

5 IMPACT ON EQUIPMENT STATUS CONFIGURATION

THIS TEST X DOES ☐ DOES NOT CONTAIN HAZARDOUS OPERATIONS.

Stage alignment measurements shall be made after the stage has been aligned to the launcher. Stage targets are scanned optically to obtain target displacement data. Displacement data is translated to angular data which reflects the alignment of the stage centerline to the local gravity vector.

TEST REQUIREMENTS

NSFC - 3.4.0.3
LV - B.1.3.3

13 REV	DATE	REASON	Contractor Approval	KSC Approval
	1/1/70	REVISE EFFECTIVITY		
	1/23/72	VERIFY LV TEST REQUIREMENTS ON TEST CATALOG SHEET		
B	10-6-72	To add Test Requirement 1.3.3		
A	8-14-72	Hazardous Level Change Due to Operating Height		

14 ORIGINATOR APPROVAL
D. Oberlin/W.O. Brown

15 ORGANIZATION
CCSD

16. DATE
10-4-71

17 NASA KSC APPROVAL

18 ORGANIZATION
66-600-12

19. APPROVAL DATE
10/6/71

KSC FORM 23-18 (2/67)

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1 TEST TITLE
MEASURE SATURN IB STAGE ALIGNMENT

2 KSC TEST NUMBER
V-23276

3 EFFECTIVITY
206 & SUBS

13 LOCATION Launcher
Pedestal-VAB

14 COMPUTER PROG IDENTIFICATION
N/A

15 EST TEST TIME
2.0 Hours

16 SUPPORT REQUIREMENTS

ITEM [illegible]

17 OTHER APPLICABLE REFERENCE DOCUMENTATION

Dwg. 10M04167

18. ITEM CONTINUATION

REV 32

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE: FLIGHT CONTROL COMPUTER REDUNDANCY TEST (CTB2)

2. KSC TEST NUMBER: V-23279

3. EFFECTIVITY: AS-206 & SUBS

4. TEST OBJECTIVES

A. TO DETAIL THE STEPS NECESSARY TO PREPARE THE FLIGHT CONTROL COMPUTER AND COMPUTER INPUT SUBSTITUTE PANELS FOR AUTOMATIC OPERATION.

B. TO DETAIL THE STEPS NECESSARY TO LOAD AND EXECUTE THE AUTOMATIC COMPUTER REDUNDANCY TEST FROM THE SANDERS DISPLAY STATION.

C. THE OBJECTIVE OF THIS TEST IS TO VERIFY CONTROL COMPUTER INPUT SIGNAL REDUNDANT PATHS ARE OPERATING PROPERLY.

5. TEST DESCRIPTION EQUIPMENT STATUS/CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

DESCRIPTION

A. ALL DISCRETE SWITCHES ON THE FLIGHT CONTROL COMPUTER, CRG PANEL, AND COMPUTER INPUT SUBSTITUTE PANELS ARE PLACED IN THE AUTO POSITION.

B. FLIGHT CONTROL RECORDERS ARE MADE READY TO RECORD THE AUTOMATIC TEST COMMANDS.

C. AUTOMATIC FLIGHT CONTROL COMPUTER REDUNDANCY TEST (CTB2) IS REQUESTED, LOADED, AND EXECUTED FROM THE GROUND COMPUTER SANDERS DISPLAY CONSOLE (NO. 4).

D. FLIGHT CONTROL COMPUTER INPUT STIMULUS WILL BE SUPPLIED FROM THE LVDC/LVDA AND CONTROL/EDS RATE GYRO SYSTEMS.

E. CONTROL OF THE VARIOUS RELAY COMBINATIONS WILL BE ATTAINED BY COMMANDS TO THE CONTROL COMPUTER RELAY MATRIX. THE CONTROL COMPUTER COMPARATORS; VALVE CURRENTS AND RELAY CURRENTS WILL BE MONITORED THROUGHOUT THE PERFORMANCE OF THIS TEST.

F. LVDA LADDER OUTPUTS WILL BE USED TO CHECK THE SPACECRAFT REDUNDANT RELAYS IN THE FLIGHT CONTROL COMPUTER.

(CONTINUED IN BLOCK 18, PAGE 2)

PHASE: III, IV

TEST REQUIREMENTS

MSFC: 7921601 — TM-011-001-2H B.7.0.1
0.3.1.2.2.5.1
0.3.1.2.6.1
0.3.1.2.6.2

6 REV.	DATE	REASON	Contractor Approval	KSC Approval
B	8/27/74	REVISED MSFC REQUIREMENTS	C.R. Ramig 9/9/74	[illegible] 9/6/74
A	08-29-3	REVISE BLOCK 16	S. B. Hays	DW Ely 9/24/73

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
R. L. Hinton 4/12/72	IBM - 918	4/12/72
10. NASA-KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
George W. Ely	LV-GDC-33	4/13/72

KSC FORM 83-336 (7/67)

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE: FLIGHT CONTROL COMPUTER REDUNDANCY TEST (CTB2)

2. KSC TEST NUMBER: V-23279

3. EFFECTIVITY: AS-206 & SUBS

13. LOCATION	14. COMPUTER PROG. INDENTIFICATION	15. EST. TEST TIME
LC-39	CTB2	6 MEN - 1 HOUR

16. SUPPORT REQUIREMENTS

INTERSTAGE: IU GROUND AND STAGE POWER
S-IVB STAGE POWER

OFF-COMPLEX: N/A

ON-COMPLEX: FACILITY COMMUNICATIONS (OIS)
LVDC/LVDA SYSTEM

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

NONE

18. ITEM CONTINUATION

(CONTINUED FROM BLOCK 5, PAGE 1)

CONFIGURATION

A. THE LVDC/LVDA FLIGHT CONTROL COMPUTER, CONTROL/EDS RATE GYROS AND THE CONTROL SIGNAL PROCESSOR INSTALLED IN THE LAUNCH VEHICLE.

THE SPACECRAFT SIMULATOR WILL BE INSTALLED FOR THE SPACECRAFT RELAY REDUNDANCY OPTION.

B. S-IVB HYDRAULIC POWER WILL BE OFF FOR THIS TEST.

C. S-IB HYDRAULIC POWER MAY BE ON WHEN THIS TEST IS PERFORMED AS A PART OF COUNTDOWN EXERCISES.

EQUIPMENT STATUS

A. THE FOLLOWING TEST EQUIPMENT WILL BE USED:

N/A

B. THE FOLLOWING PROCEDURES/TEST MUST BE COMPLETED PRIOR TO PERFORMING THIS TASK:

1. V-23153
2. V-23281

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
FLIGHT CONTROL COMPUTER & CONTROL ACCELEROMETER RAMP GENERATOR CALIBRATION

2. KSC TEST NUMBER
V-23280

3. EFFECTIVITY
AS-206 & SUBS

4. TEST OBJECTIVES
TO VERIFY PROPER OPERATION OF THE DIGITAL RAMP GENERATORS IN THE ML ESE

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST [ ] DOES [X] DOES NOT CONTAIN HAZARDOUS OPERATIONS.

DESCRIPTION:

THIS PROCEDURE PROVIDES STEPS FOR ADJUSTING THE POWER SUPPLY OUTPUTS, ADJUSTING THE AMPLITUDE, AND VERIFYING THE SLOPE OF THE RAMP GENERATORS.

EQUIPMENT STATUS

A. THE FOLLOWING TEST EQUIPMENT WILL BE USED:

1. DVM, H/P 3440A W/3445A PLUG IN OR EQUIVALENT.
2. DECADE BOXES (2 EA) CLARO - STAT 240-C OR EQUIVALENT.
3. ONE H/P ELECTRONIC COUNTER MODEL 5532L OR EQUIVALENT.
4. ONE PORTABLE RECORDER, BRUSH MARK 280, OR EQUIVALENT.

B. THE FOLLOWING PROCEDURES/TEST MUST BE COMPLETED PRIOR TO PERFORMING THIS TASK:

N/A

CONFIGURATION

N/A

TEST REQUIREMENTS

MSFC: 7921601

0.3.1.2.3.3.2

6. REV	DATE	REASON	Contractor Approval	KSC Approval
A	12/27/71	REVISED MSFC REQUIREMENTS	G.R. Rennie 7/14/72	for E.J. Ely 4-6-72

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
W. W. Vaden 4/12/72	IBM	4/12/72
10. NASA KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
George W. Ely	LV-GDC-33	4/13/72

KSC FORM 21-336 (7-67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
FLIGHT CONTROL COMPUTER AND CONTROL ACCELEROMETER RAMP GENERATOR CALIBRATION

2. KSC TEST NUMBER
V-23280

3. EFFECTIVITY
AS-206 & SUBS

13. LOCATION
LC-39

14. COMPUTER PROG. IDENTIFICATION
NOT REQUIRED

15. EST. TEST TIME
3 MEN - 4 HOURS

16. SUPPORT REQUIREMENTS

INTERSTAGE:	IU GROUND POWER
OFF-COMPLEX:	N/A
ON-COMPLEX:	QUALITY ASSURANCE FACILITY COMMUNICATIONS (OIS) ESE DDAS

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

NONE

18. ITEM CONTINUATION

REV 32

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 3

1. TEST TITLE
FLIGHT CONTROL COMPUTER SUBSYSTEM TEST

2. KSC TEST NUMBER
V-23281

3. EFFECTIVITY
AS-206 & SUBS

4. TEST OBJECTIVES
TO PERFORM INPUT POWER VERIFICATION TEST, STATIC NULL OFF-SET TEST, SPACECRAFT INPUT LIMITER TEST, SIVB BURN ENABLE REDUNDANCY CHECK, SIB MODE COMMAND AT LIFTOFF CHECK, PSI AND PHI DOT INPUT REDUNDANCY TEST, T.M. OUTPUT VERIFICATION, AND PSI MEASURING CALIBRATION.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST ☐ DOES [X] DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

DESCRIPTION:

A. THE REDUNDANT INPUT POWER FOR FLIGHT CONTROL COMPUTER WILL BE TESTED FOR PROPER MAGNITUDE AND POLARITY PRIOR TO INITIAL UNIT CABLE CONNECTIONS.

B. FLIGHT CONTROL COMPUTER OPERATION IS VERIFIED UTILIZING EACH OF ITS INDIVIDUAL REDUNDANT POWER INPUT CAPABILITIES.

C. THE STATIC NULL OFFSETS OF THE FLIGHT CONTROL COMPUTER WILL BE VERIFIED AND RECORDED.

D. VERIFICATION OF THE FCC TELEMETRY FOR TEMP, MODES, SERVO, AND SPATIAL COMPARATORS, POWER INPUTS, AND INVERTER DETECTOR.

E. CALIBRATE WITH PSI INPUTS, THE FCC PSI PANEL METERS AND FCC ANALOG PSI RECORDER CHANNELS. MEASURING STATION WILL VERIFY AND RECORD PSI MEASUREMENTS.

(CONTINUED IN BLOCK 18, PAGE 2)

TEST REQUIREMENTS
MSFC: 7921631 TM-011-001-2H

PHASE: III

0.3.1.2.0.4.1 ✓, B 7.0.1 ✓
0.3.1.2.0.6.1 ✓
0.3.1.2.0.6.1.2 ✓
0.3.1.2.2.1.1 ✓
0.3.1.2.2.6.3 ✓

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
B	5/27/74	REVISED MSFC REQUIREMENTS	C. R. Ramsey 4/8/74	A. W. Ely
A	10/16/72	REVISE TEST REQUIREMENTS AND BLOCK 18	H. H. Hester	H. W. Ely

7. CONTRACTOR APPROVAL: H. H. Hester 4/19/72
8. ORGANIZATION: IBM
9. DATE: 4/12/72
10. NASA KSC APPROVAL: George W. Ely
11. ORGANIZATION: LV-GDC-33
12. APPROVAL DATE: 4/13/72

KSC FORM 23.330 (7-67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 3

1. TEST TITLE
FLIGHT CONTROL COMPUTER SUBSYSTEM TEST

2. KSC TEST NUMBER
V-23281

3. EFFECTIVITY
AS-206 & SUBS

13. LOCATION
LCC/IU/LC-39

14. COMPUTER PROG. IDENTIFICATION
N/A

15. EST. TEST TIME
6 MEN - 10 HOURS

16. SUPPORT REQUIREMENTS

INTERSTAGE: IU GROUND AND STAGE POWER
SIVB STAGE POWER

OFF-COMPLEX: N/A

ON-COMPLEX: QUALITY ASSURANCE
FACILITY COMMUNICATIONS (OIS)
LVDC/LVDA SYSTEMS
IU ELECTRICAL
IU MEASURING
SIVB MEASURING

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

NONE

18. ITEM CONTINUATION

BLOCK 5 CONTINUED FROM PAGE 1

F. THE CAPABILITY OF THE FLIGHT CONTROL COMPUTER TO LIMIT THE SPACECRAFT STEERING COMMAND (SIMULATED) VOLTAGE LEVELS WILL BE VERIFIED.

G. THE REDUNDANT INPUT CAPABILITY TO ENABLE SIVB BURN MODE WILL BE VERIFIED.

H. THE ABILITY TO COMMAND THE FLIGHT CONTROL COMPUTER TO THE S-IB BURN MODE AT LIFTOFF WILL BE VERIFIED.

I. PSI AND PHI DOT REDUNDANT INPUT CIRCUITRY WITHIN THE FCC WILL BE VERIFIED.

EQUIPMENT STATUS

A. THE FOLLOWING TEST EQUIPMENT WILL BE USED:

1. INTERRUPT BOX-8 PIN-P/N JB2P0193 OR EQUIVALENT.
2. INTERRUPT BOX-23 PIN-P/N JB2P0217 OR EQUIVALENT.
3. INTERRUPT BOX-30 PIN-P/N JB2P0231 OR EQUIVALENT.
4. INTERRUPT BOX-61 PIN-P/N JB2P0229 OR EQUIVALENT.
5. INTERRUPT BOX-55 PIN-P/N JB2P0228 OR EQUIVALENT.
6. DIGITAL VOLTMETER, HP3440, OR EQUIVALENT.
7. SIMPSON 260.

B. THE FOLLOWING PROCEDURES/TEST MUST BE COMPLETED PRIOR TO PERFORMING THIS TASK:

NONE

REV 32

APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET (CONTINUATION SHEET)	PAGE 3 OF 3
1. TEST TITLE FLIGHT CONTROL COMPUTER SUBSYSTEM TEST	2. KSC TEST NUMBER V-23281
	3. EFFECTIVITY AS-206 & SUBS

ITEM CONTINUATION

BLOCK 5 CONTINUED FROM BLOCK 18, PAGE 2

CONFIGURATION:

FLIGHT CONTROL COMPUTER INSTALLED IN LAUNCH VEHICLE.

KSC FORM 23-336A (7/67)

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
CONTROL ACCELEROMETER FUNCTIONAL, SCALE FACTOR, POLARITY AND MEASURING CALIBRATION TEST

2. KSC TEST NUMBER
V-23282

3. EFFECTIVITY
206 & SUBS

4. TEST OBJECTIVES

THE OBJECTIVES OF THIS TEST PROCEDURE ARE:

1. TO PERFORM A FUNCTIONAL TEST TO VERIFY SCALE FACTORS.
2. TO PERFORM A POLARITY CHECK.
3. TO VERIFY THE MEASURING CALIBRATION CURVES AND TO CALIBRATE THE FLIGHT CONTROL RECORDER GAMMA DOUBLE - DOT CHANNELS AND THE GSE GAMMA DOUBLE - DOT PANEL METERS.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST. __ DOES XX DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

DESCRIPTION

1. THE CONTROL ACCELEROMETER WILL BE CHECKED FOR FUNCTIONAL OPERATION AND SCALE FACTORS BY THE USE OF TILT TABLE(S) INSTALLED IN THE IU STAGE.

2. THE CORRECT POLARITY WILL BE VERIFIED BY PHYSICALLY TILTING THE CONTROL ACCELEROMETER WHILE ELECTRICALLY CONNECTED IN FLIGHT CONFIGURATION IN THE IU STAGE.

3. ESE TEST SIGNALS (DIGITAL RAMP GENERATOR RAMP COMMANDS) WILL DRIVE THE CONTROL ACCELEROMETER OUTPUT SIGNAL TO SEVERAL PREDETERMINED VALUES. AT EACH OF THESE VALUES, THE IU MEASURING STATION WILL VALIDATE COMPONENT PERFORMANCE WITH MEASUREMENT CALIBRATION CURVES, AND THE FLIGHT CONTROL RECORDERS AND ASSOCIATED PANEL METERS WILL BE CALIBRATED.

PHASE: III

TEST REQUIREMENTS
MSFC: 7921601

0.3.1.2.0.4.1
0.3.1.2.3.3.1
0.3.1.2.3.3.4
0.3.1.2.0.3.1

MSFC: TM-011-001-2H
B.1.1.1.1.2

REV.	DATE	REASON	Contractor Approval	KSC Approval
C	8-27-74	REVISED MSFC REQUIREMENTS	C R Ramsey 9/3/74	H W Ely 9/3/74
B	06-29-73	REVISE BLOCK 16	J B Hogge	H W Ely 6/29/73
A	5/18/72	REVISE BLOCKS 1, 4, 5 AND 16	H.D. Hester	Hugo W Ely

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
S/H.D. HESTER H.D. Hester	IBM - 918	4/12/72
10. NASA/KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
S/H.W. ELY Hugo W Ely	3-31-72 LV-GDC-33	4/13/72

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
CONTROL ACCELEROMETER FUNCTIONAL, SCALE FACTOR, POLARITY AND MEASURING CALIBRATION TEST

2. KSC TEST NUMBER
V-23282

3. EFFECTIVITY
206 & SUBS

13. LOCATION
LC 39

14. COMPUTER PROC. INDENTIFICATION
NOT REQUIRED

15. EST. TEST TIME
4 MEN - 4 HOURS

16. SUPPORT REQUIREMENTS

INTERSTAGE: GROUND POWER, IU POWER, SIVB POWER

OFF-COMPLEX: N/A

ON-COMPLEX: QUALITY ASSURANCE

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

NONE

18. ITEM CONTINUATION

REV 32

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KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
FUNCTIONAL CHECK OF ESE RECORDERS (STANDBY)

2. KSC TEST NUMBER
V-23283

3. EFFECTIVITY
AS REQUIRED

4. TEST OBJECTIVES

A. TO VERIFY THAT THE LCC RECORDER SYSTEM IS READY TO SUPPORT VEHICLE TESTING.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

DESCRIPTION

A. THIS PROCEDURE WILL VERIFY THE COMPATIBILITY BETWEEN THE ANALOG RECORDER CONTROL PANEL AND THE RECORDER SYSTEM. ALSO THE CALIBRATION VOLTAGES WILL BE SET UP.

B. BASELINE CHARTS WILL BE ESTABLISHED FOR THE FUNCTIONAL TEST.

C. THIS PROCEDURE WILL VERIFY THE FUNCTIONAL OPERATION AND CALIBRATION OF THE RECORDER SYSTEM PRIOR TO TESTING PERFORMED AFTER MEASURING CALIBRATION.

EQUIPMENT STATUS

A. THE FOLLOWING TEST EQUIPMENT WILL BE USED:

1. DVM, H/P 3440A W/3445A PLUG IN OR EQUIVALENT.

B. THE FOLLOWING PROCEDURES/TEST MUST BE COMPLETED PRIOR TO PERFORMING THIS TASK:

1. N/A

CONFIGURATION: N/A

TEST REQUIREMENTS

MSFC: N/A

6. REV.	DATE	REASON	Contractor Approval	KSC Approval

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
[signature] 4/12/72	IBM	4/12/72
10. NASA KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
George W. Ely	LV-GDC-33	4/13/72

KSC FORM 23-118 (7-67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
FUNCTIONAL CHECK OF ESE RECORDERS (STANDBY)

2. KSC TEST NUMBER
V-23283

3. EFFECTIVITY
AS REQUIRED

13. LOCATION	14. COMPUTER PROG. INDENTIFICATION	15. EST. TEST TIME
LC-39	NOT REQUIRED	2 MEN-4 HOURS

16. SUPPORT REQUIREMENTS

INTERSTAGE: IU GROUND POWER

OFF COMPLEX: N/A

ON-COMPLEX: QUALITY ASSURANCE

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

NONE

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
IU TRANSPORTATION, ERECTION AND MATING

2. KSC TEST NUMBER
V-24223

3. EFFECTIVITY 206 & SUBS

4. TEST OBJECTIVES

TO TRANSPORT THE INSTRUMENT UNIT FROM THE STORAGE AREA TO THE HOISTING AREA. HOIST THE IU TO THE S-IVB STAGE/SWS AND ATTACH MATING HARDWARE.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST ☒ DOES ☐ DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

PREREQUISITE: S-IVB FORWARD ACCESS KIT IS INSTALLED AND THE S-IVB MATING SURFACE IS PREPARED TO RECEIVE THE IU.

THE IU IS TRANSPORTED TO THE HOISTING AREA. THE HOISTING TOOL IS ATTACHED TO THE UPPER PROTECTIVE RING. THE LOWER PROTECTIVE RING HARDWARE IS REMOVED. THE IU IS LIFTED, LEVELED AND MATING SURFACE IS PREPARED FOR MATING. THE IU IS HOISTED TO THE SIVB STAGE AND THE MATING HARDWARE IS INSTALLED AND TORQUED.

THE UMBILICAL DOOR LATCH SHALL BE VERIFIED PRIOR TO IU ERECTION.

CONFIGURATION: IU ON TRANSPORTER IN STORAGE AREA.

PHASE: 1A, 11

TEST REQUIREMENTS

TM-011-001-2H:
B.1.3.1
B.1.3.2

MSFC: 7921601
0.3.3.2.3
0.3.3.3
0.3.3.3.1

BPV	DATE	REASON	Contractor Approval	KSC Approval
F	8/5/74	REVISED BLOCKS 3, 5 & 17	D.K. Ridley	
E	1/31/73	REVISE MSFC REQ'MTS & BLOCK 17	2-1-73	
D	6/19/72	REVISE MSFC REQ'MTS & BLKS 4, 5, 15 & 17	6/20/72	
C	4/19/72	REVISE BLKS. 3, 4, 5, 16 & 17	S/G.LECKIE	S/P.SCHMID
B	12/12/7	REVISE MSFC REQUIREMENTS & BLOCK 16	S/J.PEURRUNG	S/P.SCHMID
A	5/23/67	REVISE MSFC REQUIREMENTS	S/J.PEURRUNG	S/P.SCHMID

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
S/ W. B. HUNT	IBM - K73	SEPTEMBER 28, 1967
10. NASA KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
S/ P. W. SCHMID	JD - 25	OCTOBER 2, 1967

KSC FORM 23-396 (5-67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
IU TRANSPORTATION, ERECTION AND MATING

2. KSC TEST NUMBER
V-24223

3. EFFECTIVITY 206 & SUBS

13. LOCATION	14. COMPUTER PROC. INDENTIFICATION	15. EST. TEST TIME
VAB	N/A	6 MEN - 13 HOURS

16. SUPPORT REQUIREMENTS

INTERSTAGE: S-IVB MECH

OFF-COMPLEX: BENDIX SHOPS

ON-COMPLEX:
250/25 TON CRANE
PLATFORMS
VAB DOORS
IBM QA
KSC SAFETY
KSC SECURITY
SWING ARMS
IBM MECHANICAL

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

TM-011-001-2H	MIL-C-5541	V-26547	60C18209	60C18259
HI-322-13000	7921601	V-34046	60C18210	60C18260
K-V-053	13M50202		60C18211	60C18261

18. ITEM CONTINUATION

REV 32

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
INSTRUMENT UNIT DEMATING (STANDBY)

2. KSC TEST NUMBER
V-24225

3. EFFECTIVITY
AS REQUIRED

4. TEST OBJECTIVES

TO REMOVE THE INSTRUMENT UNIT FROM THE S-IVB AND TRANSPORT IT TO STORAGE.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST [X] DOES [ ] DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

THE FOLLOWING ITEMS ARE VERIFIED: THERMAL CONDITIONING SYSTEM HAS BEEN DRAINED AND PURGED, ALL CRITICAL COMPONENTS HAVE BEEN REMOVED, ALL INTERCONNECTING ENVIRONMENTAL CONTROL AND ELECTRICAL CONNECTIONS BETWEEN THE IU AND S-IVB HAVE BEEN DISCONNECTED, UMBILICAL CONNECTIONS HAVE BEEN REMOVED. THE IU HOISTING SLING, UPPER PROTECTIVE RING (IF NECESSARY) AND TRANSPORTER ARE POSITIONED UNDER THE CRANE HOOK, AND PREPARED FOR ERECTION.

THE HOISTING SLING WITH UPPER PROTECTION RING (IF NECESSARY) ARE ERECTED, POSITIONED OVER THE IU AND LOWERED INTO PLACE. AFTER ATTACHMENT TO THE IU, THE IU/S-IVB MOUNTING HARDWARE IS REMOVED, AND, THE IU ELEVATED AND LOWERED TO THE TRANSPORTER. THE IU IS SECURED IN PLACE ON THE TRANSPORTER AND THE PROTECTION COVERS INSTALLED. THE HOISTING SLING IS REMOVED AND THE IU AND SLING TRANSPORTED BACK TO STORAGE.

CONFIGURATION: IU ERECTED ON S-IVB

TEST REQUIREMENTS

MSFC: N/A

6. REV.	DATE	REASON	Contractor Approval	KSC Approval

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
	IBM-906	29 SEPTEMBER 1967
10. NASA KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
	JD-25	10/6/67

KSC FORM 23-338 (7-67)

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APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
INSTRUMENT UNIT DEMATING (STANDBY)

2. KSC TEST NUMBER
V-24225

3. EFFECTIVITY
AS REQUIRED

12. LOCATION
VAB

14. COMPUTER PROG. INDENTIFICATION
N/A

19. EST. TEST TIME
6 MEN 12 HOURS

16. SUPPORT REQUIREMENTS

INTERSTAGE: S-IVB MECH.

OFF-COMPLEX: BENDIX SHOPS

ON-COMPLEX: 750/25 TON CRANE
PLATFORMS
VAB DOORS
IBM QA
KSC SAFETY
SECURITY
SWING ARMS

17. OTHER APPLICABLE REFERENCE DOCUMENTATION
HT-322-13000
K-V-053

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE: IU PNEUMATIC & TCS TEST

2. KSC TEST NUMBER: V-24228

3. EFFECTIVITY: 206 & SUBS

4. TEST OBJECTIVES

TO VERIFY THE IU PNEUMATIC SYSTEM AND THERMAL CONDITIONING SYSTEM FLOWS, PRESSURES AND TEMPERATURES ARE WITHIN LIMITS.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT CONTAIN HAZARDOUS OPERATIONS.

DURING NORMAL POWER ON, IN CLOSED LOOP CONFIGURATION, THE SYSTEMS ARE TESTED BY VARYING THE GROUND COOLANT TEMPERATURE AND MONITORING OR RECORDING CRITICAL FLOW RATES, TEMPERATURES AND PRESSURES. ADDITIONAL MEASUREMENTS ARE RECORDED FOR REFERENCE. CAPABILITY TO EMERGENCY VENT AIRBORNE IU GN2 SYSTEMS TO 1000 PSI IS VERIFIED, INCLUDING VENTING WITH GROUND POWER ONLY.

CONFIGURATION: VEHICLE IS ERECTED, STAGE POWER APPLIED, CLOSED LOOP CONFIGURATION.

TEST REQUIREMENTS

AS-206 & SUBS
MSFC: 7921601

TM-011-001-2H

B.1.7.1.2

0.3.5.2.5.1
0.3.5.2.5.1.1
0.3.5.2.5.1.2.1
0.3.5.3.3
0.3.5.2.5.3
0.3.5.2.5.2
0.3.5.2.5.1.2.2.1
0.3.5.2.5.1.2.2.2

PHASE: III

REV.	DATE	REASON	Contractor Approval	KSC Approval
		SEE BLOCK 18 FOR REVISION HISTORY		

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
S/A. B. HUNT	IBM - K73	OCTOBER 3, 1967
10. NASA KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
S/P. W. SCHMID	JD-25	OCTOBER 6, 1967

KSC FORM 23-316 (7-67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE: IU PNEUMATIC & TCS TEST

2. KSC TEST NUMBER: V-24228

3. EFFECTIVITY: AS-299 & SUBS

13. LOCATION: VAB

14. COMPUTER PROG. INDENTIFICATION: N/A

15. EST. TEST TIME: 3 MEN, 4 HOURS

16. SUPPORT REQUIREMENTS

INTERSTAGE: S-IVB STAGE POWER (EXCEPT AS-513 & AS-515)

OFF-COMPLEX: N/A

ON-COMPLEX: IBM QA
IBM MEASURING
IU STAGE POWER
IBM MECHANICAL
IBM ELECTRICAL NETWORKS

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

MSFC-MAN-008 K-V-053
MSFC-MAN-014 7921601
MSFC-MAN-036

18. ITEM CONTINUATION

REV.	DATE	REASON	CONTR. APP.	KSC APP.
K	8/5/74	REVISED BLOCKS 3, 5 & 17		
J	2/17/73	REVISE BLOCKS 5 & 17		
I	9/18/72	REVISED BLOCKS 3,5, & 16		
H	4/19/72	REVISED BLOCKS 3,5, & 17	4-20-72 S/G. LECKIE	S/P. SCHMID
G	3/24/72	REVISED PER SPEC & CRITERIA	3-24-72 S/G. LECKIE	S/P. SCHMID
F	9/7/71	REVISE PER SPEC & CRITERIA	9-8-71 S/G. LECKIE	S/P. SCHMID
E	6/16/71	REVISE MSFC REQUIREMENTS	6-16-71 S/G. LECKIE	S/P. SCHMID
D	12/12/9	REVISE MSFC REQUIREMENTS, BLK.5&16	1-13-70 S/J. PEURRUNG	S/P. SCHMID
C	5/23/9	REVISE MSFC REQUIREMENTS	S/J. PEURRUNG	S/P. SCHMID
B	9/20/8	ADDITION OF LV REQUIREMENT	S/J.H. HANSEN	S/P. SCHMID
A	8/5/8	UPDATE MSFC REQUIREMENTS	S/J.H.HANSEN	S/P. SCHMID

REV 32

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KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
IU PNEUMATIC SYSTEM LP TEST

2. KSC TEST NUMBER
V-24298

3. EFFECTIVITY
AS-206 & SUBS

4. TEST OBJECTIVES
TO VERIFY THE PNEUMATIC SYSTEM IS LEAK TIGHT AND TO FUNCTIONALLY CHECK THE PRESSURE SWITCH AND/OR ADJUST THE FIRST STAGE REGULATOR

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST X *DOES* ___ *DOES NOT CONTAIN HAZARDOUS OPERATIONS.*

GN_2 IS SUPPLIED THROUGH THE PNEUMATIC CONSOLE, ACROSS THE SWING ARM TO PRESSURIZE THE AIR BEARING AND COOLING GN_2 SYSTEMS INCREMENTS TO 1700 PSIG. GN_2 LINES AND COMPONENTS ARE LEAK CHECKED USING LEAK DETECTOR SOLUTION. THE OUTLET PRESSURE OF THE FIRST STAGE REGULATOR IS MONITORED AND ADJUSTED, IF REQUIRED, TO MAINTAIN A PRESSURE OF 16.5 ± 0.5 PSIA. THE OUTLET PRESSURE OF THE ST-124 AIR BEARING REGULATOR IS MONITORED TO VERIFY LINE PRESSURE IS NOT EXCESSIVE. THE ACTUATION/ DEACTUATION PRESSURE OF THE PRESSURE SWITCH IS MONITORED.

THE ST-124 PLATFORM PURGE LINE IS PRESSURIZED AND LEAK CHECKED. A TEST PANEL IS CONNECTED TO THE BLEED ASSEMBLY TO PRESSURIZE THE LINES AND FITTINGS DOWNSTREAM OF THE FIRST STAGE REGULATOR TO 20 PSIG FOR LEAK TESTING.

ALL DATA IS RECORDED ON A DATA SHEET.

CONFIGURATION: VEHICLE STACKED, ST-124M EITHER INSTALLED OR NOT INSTALLED, STAGE POWER IS NOT APPLIED.

(SEE PAGE 2, BLOCK 18 FOR TEST REQUIREMENTS)

REV	DATE	REASON	Contractor Approval	KSC Approval
F	8-6-74	REVISED BLOCKS 3, 17 & MSFC REQUIREMENTS		
E	4-19-2	REVISED BLOCKS 3, 5, 16 & 17	G.E. LECKIE	P.W. SCHMID
D	1-7-70	REVISE MSFC REQUIREMENTS	J.C. PEURRUNG	P.W. SCHMID
C	5-23-9	REVISE MSFC REQUIREMENTS	J.C. PEURRUNG	P.W. SCHMID
B	3-26-9	REVISE CONFIGURATION	J.C. PEURRUNG	P. W. SHCMID
A	10-15-8	ADDITION OF MSFC DOCUMENT NUMBERS	J. H. HANSEN	P. SCHMID

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
S/W.B. HUNT	IBM - 906	SEPTEMBER 29, 1967
10. NASA/KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
S/P.W. SCHMID	JD-25	10-10-67

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
IU PNEUMATIC SYSTEM LP TEST

2. KSC TEST NUMBER
V-24298

3. EFFECTIVITY
AS-206 & SUBS

13. LOCATION
LC 39 A, B, C

14. COMPUTER PROG. IDENTIFICATION
N/A

15. EST. TEST TIME
2 MEN - 10 HOURS

16. SUPPORT REQUIREMENTS

INTERSTAGE: N/A

OFF-COMPLEX: N/A

ON-COMPLEX:
IBM QA
IU VEHICLE NET
HP GAS
OIS
KSC SAFETY
IBM MECHANICAL

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

MSFC-PROC-195	MSFC-MAN-014	TM-011-001-2H
MSFC-SPEC-164	10419906	7921601
MC-245	K-V-053	

18. ITEM CONTINUATION

(BLOCK 5 CONTINUED FROM PAGE 1)

TEST REQUIREMENTS

MSFC: 7921601
0.3.5.2.1.3
0.3.5.3.1.1
0.3.5.3.1.1.1
0.3.5.3.5.1
0.3.5.5.2

PHASE II

REV 32

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REV 32

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE: IU PNEUMATIC SYSTEM HP TEST

2. KSC TEST NUMBER: V-24299

3. EFFECTIVITY: AS-206 & SUBS

4. TEST OBJECTIVES

TO VERIFY THE PNEUMATIC SYSTEM IS LEAK TIGHT AND TO FUNCTIONALLY CHECK THE SYSTEM FLOW RATES AND PRESSURES.

5. TEST DESCRIPTION/EQUIPMENT STATUS CONFIGURATION

THIS TEST [X] DOES [ ] DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

THE HIGH PRESSURE REGULATOR ON THE PNEUMATIC CONSOLE IS ADJUSTED TO SUPPLY GN_2 TO THE PNEUMATIC SYSTEM AT 3000 PSIG. THE AREA IS CLEARED AND THE SYSTEM IS PRESSURIZED BY REMOTE OPERATION FROM THE FIRING ROOM PANEL. TEMPERATURE AND PRESSURE IS STABILIZED FOR A MINIMUM OF 2 HOURS, THE FILL VALVES ARE CLOSED AND THE SPHERES PRESSURE BLEED RATE IS MONITORED FOR 2.5 HOURS.

AT THE END OF 2.5 HOURS THE PRESSURE IS REDUCED TO 1700 PSIG AND THE PNEUMATIC SYSTEM LINES, FITTINGS, ETC., ARE LEAK CHECKED USING LEAK DETECTOR SOLUTION.

CONFIGURATION: VEHICLE ERECTED WITH STAGE POWER APPLIED.

PHASE: III, IV

(SEE BLOCK 18 FOR MSFC REQUIREMENTS)

6. REV	DATE	REASON	Contractor Approval	KSC Approval
G	8-6-4	REVISED BLOCKS 3, 5, 17 & MSFC REQUIREMENTS	D.K. Kilgore	P. Schmid
F	4-19-2	REVISED BLOCKS 3, 5, 16 & 17	G.E. LECKIE	P. SCHMID
E	9-7-71	REVISE PER SPEC. AND CRITERIA	G.E. LECKIE	P. SCHMID
D	1-8-70	REVISE BLOCKS 5 & 17	J.C. PEURRUNG	P. SCHMID
C	5-23-9	REVISE MSFC REQUIREMENTS	J.C. PEURRUNG	P. SCHMID
B	6-1--8	UPDATE MSFC REQUIREMENTS	J. HANSEN	P. SCHMID
A	1-24--8	CHANGES IN BLOCKS 1, 3, 5	J. HANSEN	P. SCHMID

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
S/W.B. HUNT	IBM - 906	3 OCTOBER 1967
10. NASA KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
S/P. SCHMID	JD - 25	10/16/67

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE: IU PNEUMATIC SYSTEM HP TEST

2. KSC TEST NUMBER: V-24299

3. EFFECTIVITY: AS-206 & SUBS

13. LOCATION: LC 39A, B, C

14. COMPUTER PROG. IDENTIFICATION: N/A

15. EST. TEST TIME: 2 MEN - 8 HOURS

16. SUPPORT REQUIREMENTS

INTERSTAGE: SIVB STAGE POWER

OFF-COMPLEX: N/A

ON-COMPLEX:
IBM QA
MEASUREMENTS
IU STAGE POWER
KSC SAFETY
DDAS
OIS
HP GAS
IBM MECHANICAL

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

MSFC-MAN-014 7921601
MSFC-MAN-008 TM-011-001-2H
10Z22204

18. ITEM CONTINUATION

(BLOCK 5 CONTINUED FROM PAGE 1)

TEST REQUIREMENTS

MSFC: 7921601

0.3.5.2.1.3.1	0.3.5.3.1.2
0.3.5.2.7	0.3.5.3.1.3
0.3.5.2.7.1	0.3.5.3.1.3.1
0.3.5.2.7.2	0.3.5.3.2
0.3.5.2.7.1.1	0.3.5.3.2.1
	0.3.5.3.2.2

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
IU WATER SYSTEM GN_2 TEST

2. KSC TEST NUMBER
V-24391

3. EFFECTIVITY
AS-206 & SUBS

4. TEST OBJECTIVES
TO VERIFY THAT THE IU WATER SYSTEM AND THE GN_2 SYSTEM DOWNSTREAM OF THE 1ST STAGE REGULATOR IS LEAK FREE.

5. TEST DESCRIPTION/EQUIPMENT STATUS/CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

THE GN_2 SYSTEM DOWNSTREAM FROM THE 1ST STAGE REGULATOR IS LEAK CHECKED AT 20 PSIG.

THE WATER SYSTEM IS PRESSURIZED (WITH THE WATER VALVE CLOSED) TO 22.5 +0.0 -0.5 PSIG. THE WATER SYSTEM IS THEN LEAK CHECKED FROM THE WATER ACCUMULATOR TO THE WATER VALVE. ADDITIONALLY, WATER VALVE SEAT LEAKAGE IS CHECKED AT THE SUBLIMATOR VENT VALVE. THE SYSTEM IS THEN DEPRESSURIZED AND RE-PRESSURIZED TO 7.0 ± 0.5 PSIG. WITH THE WATER VALVE OPEN. THE WATER SYSTEM IS THEN LEAK CHECKED DOWN STREAM OF THE WATER VALVE.

CONFIGURATION: VEHICLE STACKED WITH STAGE POWER REMOVED.

TEST REQUIREMENTS

MSFC: 7921601
0.3.5.2.1.2
0.3.5.2.1.2.1
0.3.5.2.6.4
0.3.5.2.1.3

PHASE: II, III OR IV

REV.	DATE	REASON	Contractor Approval	KSC Approval
E	8-6-74	REVISED BLOCKS 3, 5 & 17	D. R. Reilly	
D	8-3-72	REVISED BLOCKS 4, 5, 15 & 17	G. LECKIE	P. SCHMID
C	4-19-72	REVISED BLOCKS 3, 5, & 17	G. LECKIE	P. SCHMID
B	6-3-70	REVISE EFFECTIVITY	D. SCHMIDT	P. SCHMID
A	1-7-69	REVISE MSFC REQUIREMENTS	J.C. PEURRUNG	P. SCHMID

6. ORIGINATOR APPROVAL	7. ORGANIZATION	8. DATE
J.C. PEURRUNG	IBM - K73	AUGUST 8, 1969
10. KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
PAUL W. SCHMID	LV-MEC-25	AUGUST 8, 1969

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
IU WATER SYSTEM GN_2 TEST

2. KSC TEST NUMBER
V-24391

3. EFFECTIVITY
AS-206 & SUBS

13. LOCATION
VAB

14. COMPUTER PROC. INDENTIFICATION
N/A

15. EST. TEST TIME
2 MEN - 4 HOURS

16. SUPPORT REQUIREMENTS

INTERSTAGE: N/A

OFF-COMPLEX: N/A

ON-COMPLEX: IBM QA
IBM VEHICLE NETWORKS
HP GAS
IBM MECHANICAL

17. OTHER APPLICABLE REFERENCE DOCUMENTATION
MSFC-MAN-014
MSFC-SPEC-164
7921601
V-26549
TM-011-001-2H

18. ITEM CONTINUATION

REV 32

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
INSPECTION - DEVELOPMENT ENGINEERING - SATURN V

2. KSC TEST NUMBER
V-24392

3. EFFECTIVITY
508 & Subs

4. TEST OBJECTIVES
THE OBJECT OF THIS TEST IS TO VERIFY THE STRUCTURAL INTEGRITY OF THE STAGE AND INTERSTAGE, VERIFY THE ELECTRICAL INTEGRITY OF THE STAGE BY CONFIRMING CONNECTOR INTEGRITY SEALS AND PART NUMBER/SERIAL NUMBER ALLOCATIONS, VERIFY THE INTEGRITY AND CONDITION OF THE PROPULSION FLUID AND GAS LINES, AND TO DETERMINE THE NATURE AND EXTENT OF ANY DISCREPANCIES.

5. TEST DESCRIPTION EQUIPMENT STATUS/CONFIGURATION

THIS TEST [X] DOES [ ] DOES NOT CONTAIN HAZARDOUS OPERATIONS.

THE FOLLOWING ARE DESCRIBED IN THE PROCEDURE:

1. STRUCTURAL/MECHANICAL
   (A) VISUAL INSPECTION OF LH_2 TANK EXTERIOR.
   (B) VISUAL INSPECTION OF THE INTERIOR AND EXTERIOR OF THE FORWARD SKIRT, AFT SKIRT, THRUST STRUCTURE, AFT INTERSTAGE, AND STAGE PROTUBERANCES.
   (C) X-RAYING THE JUNCTION OF THE FORWARD SKIRT-FORWARD DOME TO DETERMINE THE PRESENCE OF DEBRIS AND ITS DAMAGE POTENTIAL.
   (D) X-RAYING THE JUNCTURE OF THE THRUST STRUCTURE-LO_2 TANK AFT DOME TO DETERMINE THE PRESENCE OF DEBRIS AND ITS DAMAGE POTENTIAL.
   (E) INSPECTION OF BONDED SUPPORTS IS MADE UPON RECEIPT, PRIOR TO ORDNANCE INSTALLATION AND AFTER CRYOGENIC LOADING TO VERIFY BOND INTEGRITY

2. PROPULSION
   (A) VISUAL INSPECTION OF ALL FLARED TUBE FITTINGS FOR TORQUE STRIPING.
   (B) INSPECTION OF ALL LOW PRESSURE PROPELLANT DUCTS, VENT DUCTS, AND THE J-2 ENGINE FOR DENTS AND SCRATCHES.

3. ELECTRICAL
   (A) VISUAL INSPECTION OF ALL STAGE CONNECTORS UPON ARRIVAL AT KSC TO VERIFY COMPLIANCE WITH QUALITY INSPECTION INTEGRITY SEALS.
   (B) DISCONNECTION, VERIFY AGAINST ACCEPTABLE STANDARDS, RECONNECTION, AND ADDITION OF INTEGRITY SEAL ON ALL CONNECTORS WITHOUT PROPER INTEGRITY SEALS.

(CONTINUED ON PAGE 2)

TEST REQUIREMENTS
MSFC: TR 1B76996, Para.
0.2.3.3.1.2
0.2.1.1.3.0

5. REV.	DATE	REASON	Contractor Approval	KSC Approval
C	3/18/71	Revised KSC Test No. V-24392, was O-V-24392	R.A. Eggleston 4-6-71	Completing
B	9/3/70	REVISE TEST DESCRIPTION & TEST REQUIREMENTS	R.O. Eggleston 9/3/70	Completing
A	6-10-69	UPDATE TO PROPER FORMAT AND REVISE SUPPORT REQUIREMENTS	/S/F.W. MOHME	/S/W.G. MAHONEY

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
/S/M. J. PLOMER	MDAC	April 17, 1969
10. NASA-KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
/S/WILLIAM G. MAHONEY	LV-MEC-24	4-22-69

KSC FORM 23-338 (7/67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
INSPECTION - DEVELOPMENT ENGINEERING - SATURN V

2. KSC TEST NUMBER
V-24392

3. EFFECTIVITY
508 & Subs

13. LOCATION
VAB, LC 39

14. COMPUTER PROG. INDENTIFICATION
N/A

15. EST. TEST TIME
30 Shifts

16. SUPPORT REQUIREMENTS
RD 40091-1Q

17. OTHER APPLICABLE REFERENCE DOCUMENTATION
MDAC DRAWING 1B62281,
V-29053, O-V-24087, V-24079

18. ITEM CONTINUATION

5. TEST DESCRIPTION/EQUIPMENT STATUS/CONFIGURATION (CONTINUED)

(C) VERIFICATION OF CORRECT PART NUMBERS AND SERIAL NUMBERS OF SELECTED COMPONENTS.

THE FOLLOWING EQUIPMENT STATUS/CONFIGURATION MUST EXIST:

1. ACCESS TO FORWARD SKIRT, AFT SKIRT, AFT INTERSTAGE; EXTERNAL TANKAGE, J-2 ENGINE, AND TUNNELS.

140

REV 32

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE: IU/SIVB TCS FILL
2. KSC TEST NUMBER: V-24407
3. EFFECTIVITY: AS-206 & SUBS

4. TEST OBJECTIVES

FILL THE IU/SIVB THERMAL CONDITIONING SYSTEM (TCS) WITH COOLANT.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

1. THE TCS IS FILLED WITH COOLANT.
2. A LEAK CHECK IS PERFORMED ON INITIAL FILL.
3. AN AIR ENTRAINMENT IS PERFORMED TO DETERMINE THE PERCENTAGE OF ENTRAPPED GAS.
4. THE TCS ACCUMULATOR BLADDER IS POSITIONED TO ALLOW SPECIFIED RESERVE.

CONFIGURATION: VEHICLE ASSEMBLED

TEST REQUIREMENTS

MSFC: 7921601 TM-011-001-2H
0.3.5.2.1.1 B.1.7.1.2
0.3.5.2.6.1.3.1
0.3.5.2.6.1.3.2

PHASE: II, III, IV, V, VI

REV.	DATE	REASON	Contractor Approval	KSC Approval
E	8-6-4	REVISED BLOCKS 3, 5 & 17	D.E. Riley	P. Schmid
D	9-18-2	REVISED BLOCKS 3, 4, 5, 16 & 17	G.E. LECKIE	P. SCHMID
C	4-19-72	REVISED BLOCKS 3, 5, & 17	G.E. LECKIE	P. SCHMID
B	8-20-0	UPDATE MSFC REQUIREMENTS	G.E. LECKIE	P. SCHMID
A	6-9-70	UPDATE MSFC REQUIREMENTS REF RSCC 53	D.E. SCHMIDT	P. SCHMID

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
S/D.E. SCHMIDT	IBM - K73	MARCH 31, 1970
10. NASA-KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
S/PAUL W. SCHMID	LV-MEC-25	MARCH 31, 1970

KSC FORM 23-336 7-67

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE: IU/SIVB TCS FILL
2. KSC TEST NUMBER: V-24407
3. EFFECTIVITY: AS-206 & SUBS
13. LOCATION: VAB, LC 39A, B
14. COMPUTER PROC. INDENTIFICATION: N/A
15. EST. TEST TIME: 3 MEN - 8 HOURS

16. SUPPORT REQUIREMENTS

INTERSTAGE: SIVB MECHANICAL (NOT APPLICABLE TO AS-513 & AS-515)

OFF-COMPLEX: N/A

ON-COMPLEX:
IU VEHICLE NETWORKS
GROUND POWER
HP GAS
OIS
IBM MECHANICAL
IBM QA

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

20Z42200	MSFC-MAN-008	7921601
20Z42212	MSFC-MAN-036	TM-011-001-2H
MSFC-MAN-014	13M50099	10Z22204

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE: AIR ENTRAINMENT AND BLADDER POSITIONING

2. KSC TEST NUMBER: V-24408

3. EFFECTIVITY: AS-206 & SUBS

4. TEST OBJECTIVES

DETERMINE THE IU/S1VB THERMAL CONDITIONING SYSTEM LEAKAGE RATE AND THE PERCENTAGE OF VOIDS IN THE SYSTEM, AS COMPARED TO ALLOWABLE PERCENTAGE OF VOIDS.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT CONTAIN HAZARDOUS OPERATIONS.

1. INSTALL THE VOLUME CHECK TOOL (STANDPIPE) FILLED TO A KNOWN AMOUNT OF COOLANT.
2. DETERMINE THE TCS VOID SIZE.
3. FILL TCS TO PROPER LEVEL.
4. CALCULATE PERCENTAGE OF VOID AND LEAK RATE.

CONFIGURATION: VEHICLE STACKED

TEST REQUIREMENTS

MSFC: 7921601
0.3.5.2.6.1.3.1
0.3.5.2.6.1.3.2
TM-011-001-2H
B.1.7.1.2

PHASE: III, IV, V, VI

6 REV	DATE	REASON	Contractor Approval	KSC Approval
D	8-6-4	REVISED BLOCKS 3, 5 & 17	D.K. Schmid	
C	9-18-2	REVISED BLOCKS 3, 4, 5 & 17	G.E. LECKIE	P. SCHMID
B	4-19-2	REVISED BLOCKS 3, 5 & 17	G.E. LECKIE	P. SCHMID
A	6-9-70	UPDATE MSFC REQUIREMENTS REF RSCC 53	D.E. SCHMIDT	P. SCHMID

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
S/ D.E. SCHMIDT	IBM K-73	MARCH 31, 1970
10. NASA KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
S/ P.W. SCHMID	LV-MEC-25	MARCH 31, 1970

KSC FORM 23-376 7-67

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE: AIR ENTRAINMENT AND BLADDER POSITIONING

2. KSC TEST NUMBER: V-24408

3. EFFECTIVITY: AS-206 & SUBS

13. LOCATION: VAB, LC39A, B

14. COMPUTER PROC. INDENTIFICATION:

15. EST. TEST TIME: 3 MEN - 2 HOURS

16. SUPPORT REQUIREMENTS

INTERSTAGE: N/A

OFF-COMPLEX: N/A

ON-COMPLEX:
IBM QA
IU VEHICLE NETWORKS
GROUND & VEHICLE POWER
HP GAS
OIS
IBM MECHANICAL

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

7919372-1 MSFC-MAN-008 TM-011-001-2H
KSC-C-123D MSFC-MAN-036
MSFC-MAN-014 7921601

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
M/L OAT BOOM INSTALLATION, REMOVAL AND P/M

2. KSC TEST NUMBER
V-24422

3. EFFECTIVITY AS-209 & SUBS
AS-514 & SUBS

4. TEST OBJECTIVES

1. DEFINE SUPPORT REQUIREMENTS
2. DETAIL HANDLING INSTRUCTIONS
3. IDENTIFY LOCATION OF EQUIPMENT BOTH IN STORAGE AND INSTALLED
4. IDENTIFY INSTALLATION AND REMOVAL TIMES
5. DEFINE PREVENTIVE MAINTENANCE OPERATIONS FOR OAT BOOMS IN STORAGE

5. DESCRIPTION OF EQUIPMENT UNDER TEST OPERATION

THIS TEST DOES X DOES NOT CONTAIN HAZARDOUS OPERATIONS.

PRIOR TO VEHICLE ERECTION, OAT BOOMS WILL BE INSPECTED TO ASSURE THAT THEY ARE COMPLETE AND READY FOR INSTALLATION. A SUPPORT REQUEST WILL BE GENERATED TO TRANSPORT AND INSTALL THE "BOOMS."

AFTER WAB TESTING IS COMPLETE AND AS PART OF THE M/L PREPARATIONS FOR MOVING TO THE PAD, BOOMS WILL BE TAKEN DOWN AND RETURNED TO STORAGE AREA WITH LOOSE ITEMS PROPERLY STOWED.

OAT BOOMS IN STORAGE WILL RECEIVE PREVENTIVE MAINTENANCE.

PHASE IB, IV

TEST REQUIREMENTS: N/A

REV	DATE	REASON	Contractor Approval	KSC Approval
B	4-15-74	REVISED BLOCKS 1, 3, 4, 5 AND 17	[signature]	[signature]
A	4-5-72	REVISED BLOCKS 3, 5 & 16	[signature] 4/12/72	[signature]

7. PREPARED BY (Signature)	8. ORGANIZATION	9. DATE
[signature]	IBM-K73	10-14-70
10. APPROVED BY (Signature)	11. ORGANIZATION	12. APPROVAL DATE
[signature]	LYMCC-25	10/16/70

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
M/L OAT BOOM INSTALLATION, REMOVAL AND P/M

2. KSC TEST NUMBER
V-24422

3. EFFECTIVITY AS-209 & SUBS
AS-514 & SUBS

13. LOCATION
M/L 1, 2

14. COMPUTER PROG. INDENTIFICATION
N/A

15. EST. TEST TIME
2 MEN - 4 HOURS

16. SUPPORT REQUIREMENTS

SUPPORT CONTRACTOR
HEAVY EQUIPMENT GROUP
IBM MECHANICAL
IBM INSPECTION

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

JB20141
KSC-STD-S-0001 B

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
GAGE PANEL ASSEMBLY, 1B72224 VERIFICATION

2. KSC TEST NUMBER
V-24434

3. EFFECTIVITY
AS REQUIRED

4. TEST OBJECTIVES

THIS TEST PROVIDES FUNCTIONAL CHECKOUT INSTRUCTIONS FOR ALL 1B72224 UNITS AND CALIBRATION INSTRUCTIONS FOR THOSE UNITS CALIBRATED BY MDAC.

5. TEST DESCRIPTION/EQUIPMENT STATUS/CONFIGURATION

THIS TEST [X] DOES [ ] DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

TEST DESCRIPTION/EQUIPMENT STATUS

THIS PROCEDURE SHALL BE PERFORMED AS AUTHORIZED BY THE MDAC CALIBRATION RECALL SYSTEM (REFER. SP 10.022-DF) AND SHALL PROCEED AS FOLLOWS:

1. FUNCTIONALLY TEST PRESSURE REGULATOR.
2. LEAK CHECK SYSTEM AT MAXIMUM OPERATING PRESSURE.
3. TEST PRESSURE GAGE FOR ACCURACY.

CONFIGURATION

LABORATORY TEST

STANDBY

TEST REQUIREMENT

MSFC: N/A

6. REV.	DATE	REASON	Contractor Approval	KSC Approval

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
[signature]	MDAC	3-30-71
10. NASA-KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
[signature]	IV-MFC-24	[illegible]

KSC FORM 23-398 (7/67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
GAGE PANEL ASSEMBLY, 1B72224 VERIFICATION

2. KSC TEST NUMBER
V-24434

3. EFFECTIVITY
AS REQUIRED

13. LOCATION
PCOL

14. COMPUTER PROC. INDENTIFICATION
N/A

15. EST. TEST TIME
3 HOURS

16. SUPPORT REQUIREMENTS

NONE

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

REPLACES IV-24242

LVO 220413 GAGE PANEL ASSEMBLY
1B72224 GAGE PANEL ASSEMBLY
1B72363 CMP GAGE PANEL ASSEMBLY DAC P/N 1B72224

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
IU TCS GN_2 TEST

2. REF. TEST NUMBER
V-24435

3. EFFECTIVITY
AS REQUIRED

4. TEST OBJECTIVES
TO VERIFY THAT IU THERMAL CONDITIONING SYSTEM IS LEAK FREE

5. TEST DESCRIPTION EQUIPMENT STATUS/CONFIGURATION

(REPLACES IV-24235)

THIS TEST __ *DOES* XX *DOES NOT CONTAIN HAZARDOUS OPERATIONS.*

WITH IU COOLANT LOOP DISCONNECTED FROM SIVB COOLANT LOOP, THE IU COOLANT LOOP IS GRADUALLY PRESSURIZED TO 50 PSIG WITH GN_2. ALL LINES, FITTINGS, AND COMPONENTS IN PRIMARY COOLANT LOOP ARE LEAK CHECKED. THE GN_2 IS LOCKED IN FOR ONE HOUR, AND PRESSURE IS MONITORED TO VERIFY THAT THERE ARE NO LEAKS.

THE OPEN LOOP SUPPLY AND RETURN FLEXHOSES ARE CONNECTED TOGETHER, OR THE FLIGHT U-TUBE IS INSTALLED, AND A LEAK CHECK IS PERFORMED AT 50 PSIG. THE GN_2 IS LOCKED IN FOR 15 MINUTES AND THE PRESSURE IS MONITORED TO VERIFY THAT THERE ARE NO LEAKS.

OPERATION OF PUMP PRESSURE SWITCH IS CHECKED BY VERIFYING SWITCH OPENING ON INCREASING PRESSURE AND CLOSING ON DECREASING PRESSURE.

CONFIGURATION: VEHICLE STACKED

PHASE: II

TEST REQUIREMENTS

MSFC: N/A

REV.	DATE	REASON	Contractor Approval	KSC Approval
B	3/5/74	REVISED BLOCKS 3 & 17		
A	4/19/72	REVISED BLOCKS 3, 13, AND 16		

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
	IBM - K73	3/16/71
10. NASA KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
	LV-MCC-25	3/17/71

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
IU TCS GN_2 TEST

2. KSC TEST NUMBER
V-24435

3. EFFECTIVITY
AS REQUIRED

13. LOCATION
LC 39/VAB

14. COMPUTER PROC. INDENTIFICATION
N/A

15. EST. TEST TIME
3 MEN -- 12 HOURS TOTAL

16. SUPPORT REQUIREMENTS

RD 40092, 40093

INTERSTAGE: SIVB MECHANICAL

OFF-COMPLEX: NONE

ON-COMPLEX : IBM QA
IBM MECHANICAL

17. OTHER APPLICABLE REFERENCE DOCUMENTATION
MSFC-SPEC-164 MC-245
10Z22204

18. ITEM CONTINUATION

REV 32

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE

INSTALLATION, LH_2 TANK DOOR, DSV-4B STAGE

2. KSC TEST NUMBER
V-24436

3. EFFECTIVITY
206 & Subs

4. TEST OBJECTIVES

THE OBJECT OF THIS PROCEDURE IS TO ENSURE PROPER INSTALLATION OF THE LH_2 TANK DOOR AND TO MAINTAIN SYSTEM CLEANLINESS.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST [X] DOES [ ] DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

PROVIDES DETAILED INSTRUCTIONS FOR INSTALLATION OF LH_2 TANK DOOR. PROCEDURE ENSURES THAT ALL NECESSARY EQUIPMENT AND MATERIALS ARE AVAILABLE AT STAGE TO ACCOMPLISH TASK AND THAT LH_2 TANK DOOR IS INSTALLED IN PROPER SEQUENCE. PROCEDURE ENSURES THAT SYSTEM CLEANLINESS IS MAINTAINED.

THE STAGE MAY BE IN EITHER THE VERTICAL OR HORIZONTAL POSITION.

TEST REQUIREMENTS

MSFC: N/A

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
A	7-12-72	DELETED TBD IN SUPPORT REQUIREMENTS BLOCK	R.A. English 7/12/72	

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
R.A. English 3/24/71 MDAC	MDAC	3-24-71
10. NASA-KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
	LV-MEC-29	3/24/71

KSC FORM 23 338 (7/67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE

INSTALLATION, LH_2 TANK DOOR, DSV-4B STAGE

2. KSC TEST NUMBER
V-24436

3. EFFECTIVITY
206 & Subs

13. LOCATION

14. COMPUTER PROC. INDENTIFICATION

15. EST. TEST TIME
4 hours

16. SUPPORT REQUIREMENTS

NONE

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
Q-BALL INSTALLATION AND REMOVAL

2. KSC TEST NUMBER
V-24437

3. EFFECTIVITY
AS-206 & SUBS

4. TEST OBJECTIVES
INSTALLATION AND REMOVAL OF Q-BALL, SHIM, GROUND STRAP AND ATTACHING HARDWARE.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST [X] DOES [ ] DOES NOT CONTAIN HAZARDOUS OPERATIONS.

THIS OPERATION IS DIVIDED INTO THREE PARTS:

1. Q-BALL PREP FOR INSTALLATION AND GROUND STRAP ATTACHMENT.
2. THE SHIM AND Q-BALL ARE INSTALLED ON THE ESCAPE TOWER.
3. THE SHIM AND Q-BALL ARE REMOVED FROM THE ESCAPE TOWER.

CONFIGURATION: VEHICLE ERECTED WITH ESCAPE TOWER INSTALLED OR LES HORIZONTAL IN LES STORAGE BUILDING.

PHASE: IV, V OR VI

TEST REQUIREMENTS

MSFC: 7921601
0.3.3.1.2
TM-011-001-2H
B.I.3.1

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
C	8-6-74	REVISED BLOCKS 3, 4, 5 AND 17		
B	4-19-2	REVISED BLOCKS 3, 5 AND 17	G.E. LECKIE	P. SCHMID
A	12-20-1	REVISE BLOCKS 3, 5 AND 15	G.E. LECKIE	P.SCHMID

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
S/G.E. LECKIE	IBM - K73	APRIL 14, 1971
10. NASA KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
S/PAUL W. SCHMID	LV-MEC-25	APRIL 14, 1971

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
Q-BALL INSTALLATION AND REMOVAL

2. KSC TEST NUMBER
V-24437

3. EFFECTIVITY
AS-206 & SUBS

13. LOCATION
VAB-LC 39A, B, C

14. COMPUTER PROC. INDENTIFICATION
N/A

15. EST. TEST TIME
3 MEN - 16 HOURS

16. SUPPORT REQUIREMENTS

RD-40092-3AQ

INTERSTAGE: NAR

OFF-COMPLEX: NONE

ON-COMPLEX: IBM QA
IBM MECHANICAL
KSC SAFETY
IBM STABILIZER

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

TM-011-001-2H	60C18209	60C18259
10Z12253-17	60C18210	60C18260
7921601	60C18211	60C18261

18. ITEM CONTINUATION

REV B2

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KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE: S-IVB STAGE UNLOADING, POINT BARROW
2. KSC TEST NUMBER: V-24442
3. EFFECTIVITY: AS REQUIRED

TEST OBJECTIVES

To unload an S-IVB stage and attendant equipment from the Point Barrow at Port Canaveral, transfer to NASA barge, unload S-IVB from NASA barge at VAB dock and move S-IVB into VAB.

4. TEST DESCRIPTION/EQUIPMENT STATUS/CONFIGURATION

THIS TEST [X] DOES [ ] DOES NOT CONTAIN HAZARDOUS OPERATIONS.

1. Preliminary preparations at Port Canaveral
2. Transfer of S-IVB and attendant equipment from Point Barrow to NASA barge.
3. Unload NASA barge and transport S-IVB and attendant equipment to VAB low bay area.

Equipment Status/Configuration

1. A clear area for mooring Point Barrow and NASA barge at Port Canaveral.
2. A clear area for mooring NASA barge at VAB dock.
3. A clear area on VAB dock for washing stage covers with fresh water.
4. Clear area in VAB low bay transfer aisle for S-IVB stage/transporter.

TEST REQUIREMENTS

MSFC N/A

5. REV.	DATE	REASON	Contractor Approval	KSC Approval
A	7-11-72	Added RD for Saturn IB; Changed Effectivity to "As Required"	R.O. England 7-14-72	

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
R.O. England 4/20/71	MDAC	11/29/71
10. NASA-KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
	LV-MCC-24	12/3/71

KSC FORM 23 338 (7/67)

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APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE: S-IVB STAGE UNLOADING, POINT BARROW
2. KSC TEST NUMBER: V-24442
3. EFFECTIVITY: AS REQUIRED
13. LOCATION
14. COMPUTER PROC. INDENTIFICATION
15. EST. TEST TIME: 16 hours

16. SUPPORT REQUIREMENTS

RD 40090 - 2AA
SID-24442-D

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

MDAC Dwg 1B38090, 1B38091, O-I-24118-S-IVB

This TCS supersedes IV-24248

18. ITEM CONTINUATION

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REV 32

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
PREPARATION OF IU PRIOR TO HYPERGOLIC LOADING

2. KSC TEST NUMBER
V-24443

3. EFFECTIVITY
AS-206 & SUBS

4. TEST OBJECTIVES
TO INSTALL AND REMOVE THE IU HYPERGOLIC SPILL PROTECTIVE CURTAIN AND TO SEAL THE IU PRIOR TO HYPERGOL LOADING.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

THIS PROCEDURE PROVIDES FOR THE INSTALLATION AND REMOVAL OF:

1. IU HYPERGOLIC SPILL PROTECTIVE CABLE TRAY COVERS, CURTAINS & TUNNEL
2. GAPS, JOINTS, FASTENERS, OPENINGS, ETC. SEALING WITH COMPATIBLE TAPE.

CONFIGURATION: VEHICLE STACKED

PHASE: III, IV, V, VI

TEST REQUIREMENTS

MSFC: TM-011-001-2H
B.6.0.1

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
B	8-6-4	REVISED BLOCKS 3, 5 AND 17	D F Riley	R Schmid
A	4-19-72	REVISED BLOCKS 3, 5, 16 AND 17	G.E. LECKIE	P.W. SCHMID

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
G.E. LECKIE	IBM - K73	APRIL 28, 1971
10. NASA KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
PAUL W. SCHMID	LV-MEC-25	APRIL 29, 1971

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
PREPARATION OF IU PRIOR TO HYPERGOLIC LOADING

2. KSC TEST NUMBER
V-24443

3. EFFECTIVITY
AS-206 & SUBS

13. LOCATION
LC-39A, B, C

14. COMPUTER PROC. INDENTIFICATION
N/A

15. EST. TEST TIME
4 MEN - 8 HOURS EACH

16. SUPPORT REQUIREMENTS

INTERSTAGE: N/A

OFF-COMPLEX: N/A

ON-COMPLEX: IBM QA
IBM MECHANICAL
IBM VEHICLE NETWORKS

17. OTHER APPLICABLE REFERENCE DOCUMENTATION
V-26549 TM-011-001-2H
7916195
7915900-1

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
STAGE LOADING, DSV-4B, AIR CARRIER - KSC

2. KSC TEST NUMBER
V-24444

3. EFFECTIVITY
As Required

4. TEST OBJECTIVES

THIS PROCEDURE DESCRIBES THE STEPS REQUIRED TO TRANSFER THE S-IVB STAGE FROM MODEL DSV-4B-300 TRANSPORTER TO CLT AND SUBSEQUENT LOADING INTO THE SUPER GUPPY.

5. TEST DESCRIPTION EQUIPMENT STATUS/CONFIGURATION

THIS TEST [X] DOES [ ] DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

THE FOLLOWING OPERATIONS ARE INCLUDING IN THIS DRAWING:

1. PRELIMINARY OPERATIONS (ALIGNMENT OF TRANSPORTER TO CLT)
2. STAGE TRANSFER FROM TRANSPORTER TO CLT
3. PREPARATION OF SUPER GUPPY TO RECEIVE STAGE
4. ALIGNMENT OF CLT TO SUPER GUPPY
5. TRANSFER OF STAGE FROM CLT TO SUPER GUPPY
6. INSTALLATION OF SUPER GUPPY TIE-DOWNS TO STAGE
7. STAGE SECURITY CHECK

THE FOLLOWING EQUIPMENT STATUS MUST BE IN EFFECT:

1. VERIFICATION OF CLT PROOF-LOAD TO DAC REQUIREMENTS
2. SUPER GUPPY PROPERLY POSITIONED AT SKID STRIP TO DAC REQUIREMENTS

NOTE: THIS PROCEDURE IS NOT SCHEDULED OR PLANNED AND WILL BE RELEASED ON AN "AS REQUIRED" BASIS.

CONFIGURATION: SUPER GUPPY LANDED AT SKID STRIP AND STAGE IN CONFIGURATION TO BE LOADED.

STANDBY

TEST REQUIREMENTS

MSFC: N/A

4. REV.	DATE	REASON	Contractor Approval	KSC Approval
A	6-14-72	Added RD for Saturn IB		

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
	McDonnell Douglas	5-4-71
10. NASA KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
	LV-MEC-24	5/4/71

KSC FORM 23-339 (7-67)

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APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
STAGE LOADING, DSV-4B, AIR CARRIER - KSC

2. KSC TEST NUMBER
V-24444

3. EFFECTIVITY
As Required

13. LOCATION
SKID STRIP

14. COMPUTER PROC. INDENTIFICATION
N/A

15. EST. TEST TIME
20 hours

16. SUPPORT REQUIREMENTS

RD 40090-2M
RD 21440

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

DAC DWG 1B62328 THIS TCS SUPERSEDES O-IV-24223.

18. ITEM CONTINUATION

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REV 32

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
IU WATER ACCUMULATOR FILL

2. KSC TEST NUMBER
V-24445

3. EFFECTIVITY
AS-206 & SUBS

4. TEST OBJECTIVES

TO FILL IU WATER ACCUMULATOR

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST [ ] DOES [X] DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

THIS TEST DESCRIBES TWO METHODS FOR FILLING WATER ACCUMULATOR.

METHOD I: THE WATER ACCUMULATOR IS FILLED USING WATER ACCUMULATOR SERVICING ASSEMBLY CART. THE CART SUPPLY RESERVOIR IS FILLED WITH DEMINERALIZED WATER WHICH IS THEN TRANSFERRED TO IU WATER ACCUMULATOR.

METHOD II: THE WATER IS TRANSFERRED FROM PLASTIC CONTAINERS TO IU WATER ACCUMULATOR. TCS & GBS GN_2 SYSTEMS ARE LEAK TESTED AT PREFLIGHT CHECKOUT PRESSURE FOLLOWING ACCUMULATOR FILL.

IN BOTH METHODS, THE QUANTITY OF WATER TRANSFERRED TO ACCUMULATOR IS MEASURED TO VERIFY 144 POUNDS MINIMUM IS IN ACCUMULATOR.

CONFIGURATION: VEHICLE STACKED

PHASE: VI

TEST REQUIREMENTS

MSFC: 7921601
0.3.5.2.6.2.1.1
0.3.5.2.6.2.1.2
0.3.5.2.6.2.1.3
0.3.5.2.6.2
0.3.5.2.1.3
0.3.5.2.6.2.1
TM-011-001-2H
B.4.0.1

REV	DATE	REASON	Contractor Approval	KSC Approval
B	8-6-74	REVISED BLOCKS 3, 5 AND 17	[signature]	[signature]
A	-19-72	REVISED BLOCKS 3, 5, 16 AND 17	G.E. LECKIE	P. SCHMID

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
S/G.E. LECKIE	IBM - K73	MAY 7, 1971
10. NASA KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
S/PAUL W. SCHMID	LV-MEC-25	MAY 5, 1971

KSC FORM 21 (REV. 8)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
IU WATER ACCUMULATOR FILL

2. KSC TEST NUMBER
V-24445

3. EFFECTIVITY
AS-206 & SUBS

13. LOCATION
LC-39A, B, C

14. COMPUTER PROC. INDENTIFICATION
N/A

15. EST. TEST TIME
2 MEN - 4 HOURS EACH

16. SUPPORT REQUIREMENTS

INTERSTAGE: N/A

OFF-COMPLEX: N/A

ON-COMPLEX: IBM QA
IBM MECHANICAL
IBM VEHICLE NETWORKS

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

MSFC-MAN-038	20Z42212
MSFC-SPEC-164	7921601
MS33540	TM-011-001-2H

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
INSPECTION AND CORROSION CONTROL OF S-IB STAGE

2. KSC TEST NUMBER
V-24497

3. EFFECTIVITY
206 & SUBS

4. TEST OBJECTIVES

TO INSPECT S-IB STAGE FOR CORROSION

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST __ DOES XX DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

THIS PROCEDURE COVERS THE PERIODIC GENERAL CORROSION AND STRESS CORROSION CRACK INSPECTIONS OF THE S-IB VEHICLE.

PART I - INITIAL AND QUARTERLY CRACK INSPECTIONS OF MAJOR STRUCTURAL PARTS
PART II - MONTHLY CRACK INSPECTIONS OF CRITICAL STRUCTURAL PARTS
PART III - FORTNIGHTLY CRACK INSPECTION OF CRITICAL STRUCTURAL PARTS.
PART IV - 48 HOUR CRACK INSPECTION OF CRITICAL STRUCTURAL PARTS WITH HIGH SUSTAINED STRESS.
PART V - H-1 ENGINE CORROSION INSPECTION
PART VI - INITIAL AND QUARTERLY GENERAL CORROSION INSPECTION
PART VII - MONTHLY GENERAL CORROSION INSPECTION
PARTVIII - ITEMS FOUND TO HAVE CORROSION SHALL BE CLEANED AND REPAIRED BY AN ACCEPTABLE METHOD OR REPLACED BY ACCEPTABLE SPARES.

PHASE N/A

TEST REQUIREMENTS
SEE ITEM 18

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
D	3/3/74	TEST REQUIREMENT CHANGES	K. Yamasaki	R. Newall
C	5/7/74	TO ADD DOCUMENTATION REQUIREMENTS	J.W. Rathjen	R. Newall
B	12/5/72	CHANGE TITLE AND EFFECTIVITY	K. Yamasaki	R. Newall
A	9/13/72	ADD TEST REQUIREMENT 3.4.0.1.7	K. Yamasaki	R. Newall

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
R. W. Eddy	CCSD	12/14/71
10. NASA-KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
R. Newall	LV-MEC-23	12/15/71

KSC FORM 22-236 (7/67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
INSPECTION AND CORROSION CONTROL OF S-IB STAGE

2. KSC TEST NUMBER
V-24497

3. EFFECTIVITY
206 & SUBS

13. LOCATION
VAB OR PAD

14. COMPUTER PROC. INDENTIFICATION
N/A

15. EST. TEST TIME
24 HOURS

16. SUPPORT REQUIREMENTS

1) AIRBORNE NETWORKS
2) AIRBORNE MEASURING

17. OTHER APPLICABLE REFERENCE DOCUMENTATION
DRAWING 60C06033, 60C16037
TEST AND CHECKOUT REQUIREMENTS, SPECIFICATIONS AND CRITERIA FOR USE AT KSC. 60C06050

18. ITEM CONTINUATION

TEST REQUIREMENTS:

3.4.0.1.1
3.4.0.1.2
3.4.0.1.3
3.4.0.1.5
3.4.0.1.6
3.4.0.1.7
3.3.5.24.1 THRU 3.3.5.24.8

REV 32

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
REMOVAL OF ENVIRONMENTAL PROTECTION EQUIPMENT

2. KSC TEST NUMBER
V-24498

3. EFFECTIVITY
206 AND SUBS

4. TEST OBJECTIVES

REMOVAL ENVIRONMENTAL PROTECTION AND PREPARE STAGE FOR PRELAUNCH CHECKOUT.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

THE FOLLOWING VEHICLE ACCESS POINTS WILL BE OPENED:

A. CANISTERS 12 AND 13.
B. SEAL PLATES AS REQUIRED.
C. FUEL TANKS 3 AND 4 COVERS FORWARD SECTION.
D. FUEL AND LOX BAY DOORS AFT SECTION.
E. HEAT SHIELD PANELS AS REQUIRED.
F. CENTER BARREL.

HARD BELLOWS COVERS WILL BE REMOVED AND REPLACED WITH SOFT COVERS. FELT COVERS ARE TO BE PLACED ON ALL FORWARD FUEL AND LOX TANK BULKHEADS. LOX AND FUEL TANK BREATHERS ARE TO BE CHANGED AS THE MOISTURE MONITORS INDICATE A SATURATED CONDITION. WORK LIGHTS WILL BE INSTALLED AS REQUIRED. THE FUEL TANK LATERAL RESTRAINING HARDWARE IS REMOVED.

SPECIAL TEST EQUIPMENT REQUIRED INCLUDES:

A. SOFT BELLOWS COVERS.
B. TANK BULKHEAD FELT COVERS.
C. DRY LOX AND FUEL TANK BREATHER ASSEMBLIES.
D. SOFT ZIPPER DOORS.
E. WORK LIGHTS.

CONFIGURATION - VERTICAL POSITION

TEST REQUIREMENTS:
1) 3.4.0.1.8

PHASE 1A & II

A. REV.	DATE	REASON	Contractor Approval	KSC Approval
A	10/13/72	REQUIREMENT IS PROVIDED BY PREPS FOR CDDT AND LAUNCH V-24522		

7. ORIGINATOR APPROVAL	8. ORGANIZATION	9. DATE
	CCSD	14 DEC. 1971
10. NASA KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
	LV MEC 23	12/14/71

KSC FORM 23-338 (7-67)

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
REMOVAL OF ENVIRONMENTAL PROTECTION EQUIPMENT

2. KSC TEST NUMBER
V-24498

3. EFFECTIVITY
206 AND SUBS

13. LOCATION
VAB AND PAD

14. COMPUTER PROC. INDENTIFICATION
N/A

15. EST. TEST TIME
32 HOURS

16. SUPPORT REQUIREMENTS

NONE

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

60C11001
60C11018
60C21318
60C21319
CHECK LIST NONFLIGHT REMOVABLE ITEMS

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
S-IB STAGE GN2 CONTROL PRESSURE SYSTEM AND CALORIMETER PURGE SYSTEM FUNCTIONAL AND LEAKAGE TEST.

2. KSC TEST NUMBER
V-24499

3. EFFECTIVITY
206 AND SUBS

4. TEST OBJECTIVES

1) PERFORM FUNCTIONAL CHECK OF 750 PSI REGULATOR, RELIEF VALVE, AND SYSTEM SOLENOID VALVES.

2) PERFORM LEAK CHECK OF ALL CONTROL LINES, CONNECTIONS, AND COMPONENTS IN THE GN2 CONTROL SYSTEM AND CALORIMETER PURGE SYSTEM.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST [X] DOES [ ] DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

THE GN2 CONTROL SPHERE IS PRESSURIZED TO 100 PSIG AND THE FILL AND VENT VALVE IS CYCLED RAPIDLY TO VERIFY OPERATION OF THE VENT. THE CONTROL SPHERE IS THEN PRESSURIZED TO 2000 PSIG IN 500 PSIG INCREMENTS. THE SPHERE AND ALL ASSOCIATED LINES AND CONNECTIONS ARE LEAKCHECKED FOR EXTERNAL LEAKAGE. THE SEAT LEAKAGE OF THE SUPPLY SOLENOID AND OF THE FILL AND VENT VALVE ARE CHECKED. THE CONTROL PRESSURE REGULATOR IS INCREASED TO 750 PSIG AND FUNCTIONALLY CHECKED. THE 750 PSIG MANIFOLD AND ASSOCIATED CONTROL LINES ARE LEAKCHECKED. A LEAKCHECK OF ALL PREVALVE CONTROL PISTONS LEAKAGE AND PREVALVE CONTROL VALVE SEAT LEAKAGE IS PERFORMED WITH VEHICLE AND GROUND 750 PSIG. THE CALORIMETER PURGE CONTROL VALVE SEAT AND ALL CALORIMETER PURGE SYSTEM LINES AND CONNECTIONS ARE LEAKCHECKED. THE 750 PSIG RELIEF VALVE CRACKING PRESSURE AND RESEAT PRESSURE IS CHECKED.

VEHICLE CONFIGURATION - VERTICAL POSITION

THE TEST SHALL BE PERFORMED WITH VEHICLE AND GROUND POWER APPLIED AND ALL VALVES IN FLIGHT CONFIGURATION.

SEE TEST REQUIREMENTS ON OTHER SIDE.

6. REV	DATE	REASON	Contractor Approval	KSC Approval
E	6/7/74	To add prevalve timing requirement.		
D	8/7/73	TO REFLECT CHANGE IN MSFC TEST REQUIREMENTS 3.3.6.2.3.3 THRU 3.3.6.2.3.5		
C	1/23/73	TO REFLECT COMPLETE MSFC TEST REQUIREMENT 3.3.6.2.2.1.1 THROUGH 3.3.6.2.2.1.2		
B	9/22/72	DELETE PARAGRAPH 3.3.5.10.3	/s/ J. Hoffman	/s/ R. Newall
A	7/28/72	DELETE PARAGRAPH 4.3.5.1.1.3	/s/J. Hoffman	/s/R.Newall

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
/s/ R. W. Eddy	CCSD	9/22/71
10. NASA-KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
/s/ R. Newall	LV MEC 23	10/28/71

KSC FORM 23-338 (7/67)

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
GN2 CONTROL SYSTEM AND CALORIMETER PURGE SYSTEM FUNCTIONAL AND LEAKAGE TEST

2. KSC TEST NUMBER
V-24499

3. EFFECTIVITY
206 AND SUBS

13. LOCATION
VAB

14. COMPUTER PROC IDENTIFICATION
N/A

15. EST. TEST TIME
8 HOURS

16. SUPPORT REQUIREMENTS

1) GROUND POWER
2) S-IB STAGE POWER
3) DDAS
4) HIGH PRESSURE GAS
5) GSE MECHANICAL

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

TEST AND CHECKOUT REQUIREMENTS, SPECIFICATIONS AND CRITERIA FOR USE AT KSC. 60C06050

18. ITEM CONTINUATION

(FROM BLOCK 5)

MSFC PRELAUNCH TEST AND CHECKOUT REQUIREMENTS SATISFIED ARE:

1) 3.3.6.1.1
2) 3.3.6.2.1
3) 3.3.6.2.2.1(ALL)
4) 3.3.6.2.2.2
5) 3.3.6.2.3.1 (ALL)
6) 3.3.6.2.3.2
7) 3.3.6.2.4
8) 3.3.6.2.5.1
9) 3.3.6.2.5.2
10) 3.3.6.2.6
11) 3.3.5.21.3
12) 3.3.3.1.2.1
13) 3.3.3.1.2.2
14) 3.3.3.1.2.3
15) 3.3.4.1.2

REV 32

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
S-IB STAGE PREPARATION FOR COUNTDOWN DEMONSTRATION & LAUNCH

2. KSC TEST NUMBER
V-24522

3. VEHICLE NO.
206 AND SUBS

4. TEST OBJECTIVES

PREPARE THE S-IB STAGE FOR CDDT AND LAUNCH

5. TEST EFFECT ON EQUIPMENT STATUS CONFIGURATION

THIS TEST DOES X DOES NOT CONTAIN HAZARDOUS OPERATIONS.

THIS PROCEDURE IS USED TO SUPPORT THE VEHICLE MECHANICAL OPERATIONS PERTINENT TO WET CDDT, DRY CDDT AND THE LAUNCH COUNTDOWN.

PART I CONTAINS OPERATIONS TO SUPPORT WET CDDT AND LAUNCH COUNTDOWN. MOST OF PART I IS ONE TIME ONLY.

PART II CONTAINS OPERATIONS TO SUPPORT WET CDDT. PART II CLOSES OUT ONLY THOSE ITEMS REQUIRED TO FOR WET CDDT.

PART III CONTAINS OPERATIONS TO RECONFIGURE IN PREPARATION FOR LAUNCH COUNTDOWN.

PART IV CONTAINS OPERATIONS TO SUPPORT THE LAUNCH COUNTDOWN. PART IV CONTAINS THE FINAL CLOSE OUT OF THE VEHICLE FOR LAUNCH.

THIS PROCEDURE WILL BE ACCOMPLISHED FOR CDDT AND LAUNCH.

CONFIGURATION - VEHICLE IN FLIGHT CONFIGURATION.

MSFC REQUIREMENTS:
3.3.5.13
3.3.1.3
3.3.3.1.3
3.4.0.1.4
3.3.3.0.1 (ALL)

REV	DATE	REASON	Contractor Approval	KSC Approval
F.	7/25/74	ADDITION OF MSFC REQUIREMENT 3.3.3.0.	[illegible]	[illegible]
E.	5/11/73	COMBINE V-24522 & V-24524	J. Gerardi	J. R. Hall
D.	2/27/73	ADDITION OF MSFC 3.3.5.13 IN REQUIREMENTS	W. Fischer	R. Newall
C.	11/2-/72	DELETION OF REFERENCES TO SECTION 4.0	R. Eddy	R. Newall
B.	11/15/72	ADDITION OF (LV) T&CPS&C REQUIREMENTS	R. Eddy	J. Humphrey
A.	2/28/72	NON-HAZARDOUS PER KMI 1710.13A/SF	R. Pugh	R. Newall

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
R. Pugh	CCSD	9/22/71
10. NASA KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
R. NEWALL	LV-MEC-23	11/12/71

KSC FORM 23-338 7-67

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
S-IB STAGE PREPARATION FOR COUNTDOWN DEMONSTRATION & LAUNCH

2. KSC TEST NUMBER
V-24522

3. VEHICLE NO.
206 & SUBS

13. LOCATION
PAD

14. COMPUTER PROG IDENTIFICATION
N/A

15. EST TEST TIME
4 HOURS

16. FLIGHT REQUIREMENTS

H.P. GAS
GSE MECHANICAL
CHEMICAL ANALYSIS LABORATORY
S-IB GROUND AND STAGE POWER
PAD SAFETY
SECURITY POLICE
FIRE FIGHTING
BACK-UP BATTERIES
MEASURING
FACILITY COMM. (OIS)
RCA-110A COMPUTERS
(OIS) RECORDING

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

STAGE TEST AND CHECKOUT REQUIREMENTS, SPECIFICATIONS AND CRITERIA FOR USE AT KSC.
60C06050

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
PRELAUNCH ELECTRO-MECHANICAL TEST

2. KSC TEST NUMBER
V-24523

3. EFFECTIVITY
206 AND SUBS

4. TEST OBJECTIVES

VERIFY ALL VEHICLE AND RELATED GROUND ELECTRO-MECHANICAL COMPONENTS ARE FUNCTIONING WITH THE EXCEPTION OF THE FUEL VENTS AND FUEL FILL AND DRAIN VALVE.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST [ ] DOES [X] DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

S-IB STAGE GN2 - CONTROL SYSTEM FUNCTIONAL AND LEAKAGE TEST MUST BE PERFORMED PRIOR TO THIS TEST.

PREPARE S-IB VEHICLE AND GROUND SUPPORT TO PERFORM THIS TEST.

ALL VEHICLE AND RELATED GROUND COMPONENTS ARE VERIFIED TO BE IN FLIGHT CONFIGURATION. THE FOLLOWING ITEMS ARE CHECKED FOR OPERATION:

(A) CONTROL SPHERES PRESSURIZING AND VENT VALVES
(B) FUEL SPHERES PRESSURIZING VALVE
(C) FUEL BUBBLING VALVE
(D) ENGINE PURGES (G.G. LOX INJ. LOX SYSTEM AND T. C. FUEL INJ.)
(E) CALORIMETER PURGE VALVE
(F) FUEL PRESSURIZING VALVES, FUEL VENT CONTROL VALVE
(G) LOX VENT VALVES
(H) LOX RELIEF VALVE
(I) LOX FILL AND DRAIN VALVE
(J) LOX BUBBLING VALVE
(K) LOX PRESSURIZING VALVE
(L) LOX ORIFICE BYPASS VALVES
(M) PREVALVES

SECURE S-IB VEHICLE AND GROUND SUPPORT COMPONENTS.

A PREREQUISITE TO THIS PROCEDURE IS THAT ALL COMPONENTS CHECKED MUST HAVE BEEN PREVIOUSLY CHECKED PER THEIR INDIVIDUAL CHECKOUT PROCEDURES.

THIS TEST IS PERFORMED AFTER VEHICLE ERECTION.

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
B	11/6/72	TITLE CHANGE		
A	2/28/72	NON-HAZARDOUS PER KMI.1710.13A/SF		

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
	CCSD	9/22/71
10. NASA KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
	LV MEC 2-3	10/28/71

KSC FORM 23-338 (7-67)

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
L-I DAY ELECTRO-MECHANICAL TEST

2. KSC TEST NUMBER
V-24523

3. EFFECTIVITY
206 AND SUBS

13. LOCATION	14. COMPUTER PROC. INDENTIFICATION	15. EST. TEST TIME
PAD	N/A	45 MINUTES

16. SUPPORT REQUIREMENTS

1) S-IB VEHICLE POWER IS REQUIRED THROUGH THIS TEST.
2) S-IB MEASURING
3) GSE MECHANICAL
4) DEE-6 OPERATION IS REQUIRED
5) LOX CONTROL PANEL OPERATOR TO OPERATE THE LOX FILL AND DRAIN VALVE IF POWER IS APPLIED TO THE PROPELLANT LOADING RACKS.
6) BACK-UP BATTERIES
7) RCA-110A COMPUTERS
8) H. P. GAS

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

18. ITEM CONTINUATION

PHASE VI

TEST REQUIREMENTS: MSFC - N/A

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
TM COMPONENTS PRESSURIZATION

2. KSC TEST NUMBER
V-24526

3. EFFECTIVITY
206 AND SUBS

4. TEST OBJECTIVES

VERIFY/ACCOMPLISH COMPONENTS PRESSURIZED FOR PRE-LAUNCH TESTS AND FLIGHT

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST [ ] DOES [X] DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

THE PROCEDURE CONSISTS OF TWO PARTS. THE FIRST PART CHECKS COMPONENT PRESSURE AND THE OTHER PART PRESSURIZES THOSE COMPONENTS AS REQUIRED. "USE OR VOID" BLANKS ARE PROVIDED FOR INDICATING THOSE PORTIONS OF THE PROCEDURE WHICH WILL BE REQUIRED FOR EACH PERFORMANCE.

PART I

COMPONENT PRESSURES ARE CHECKED USING A CALIBRATED TIRE PRESSURE GAGE AND RECORDED ON A DATA SHEET.

PART II

THE COMPONENTS ARE PRESSURIZED AS REQUIRED, BY CONNECTING A REGULATOR PANEL TO THE COMPONENT SCHRADER VALVE. THE TEST SET-UP IS LEAK CHECKED AND THEN A 10-MINUTE PRESSURE DECAY TEST IS RUN ON THE PRESSURIZED COMPONENT. NO PRESSURE DROP IS ALLOWED. COMPONENTS CAN BE PRESSURIZED WHEN MOUNTED IN VEHICLE OR AS AN INDIVIDUAL COMPONENT.

COMPONENT PRESSURE LIMITS ARE AS FOLLOWS:

CONTAINER ASSEMBLIES:
FM/RF ASSEMBLY
PCM/RF ASSEMBLY

PRESSURIZATION LIMITS - 6.5 ± 0.5 PSIG

TEST REQUIREMENTS:
MSFC: 3.2.1.5.3
3.2.2.8.3

VEHICLE CONFIGURATION N/A

# REV	DATE	REASON	Contractor Approval	KSC Approval

7. CONTRACTOR APPROVAL: K. Slugh
8. ORGANIZATION: CCSD
9. DATE: 9/22/71

10. NASA/KSC APPROVAL:
11. ORGANIZATION: LV Mgr. 2-3
12. APPROVAL DATE: 11/22/71

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
TM COMPONENT PRESSURIZATION

2. KSC TEST NUMBER
V-24526

3. EFFECTIVITY
206 AND SUBS

13. LOCATION
VAB

14. COMPUTER PROC. INDENTIFICATION
N/A

15. EST. TEST TIME
1 HOUR/ITEM

16. SUPPORT REQUIREMENTS

H. P. GAS

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

TEST AND CHECKOUT REQUIREMENTS, SPECIFICATIONS AND CRITERIA FOR USE AT KSC. 60C06050

COMPONENTS PRESSURIZED BY THIS PROCEDURE AND PRESSURE SPECIFICATIONS.

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1 TEST TITLE
HYDRAULIC SYSTEM PURGE AND FILL (STAND BY)

2 KSC TEST NUMBER
V-24527

3 EFFECTIVITY
AS REQUIRED

4 TEST OBJECTIVES

CLEAN (FILTER) THE HYDRAULIC FLUID IN THE ENGINE HYDRAULIC SYSTEM AND FILL THE FLUID RESERVOIR TO THE PROPER LEVEL FOR FLIGHT, IF REQUIRED.

5 TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST __ DOES X DOES NOT CONTAIN HAZARDOUS OPERATIONS.

VERIFY THAT THE HYDRAULIC GROUND SERVICER HAS BEEN PREPARED FOR USE AND NOTIFY FLIGHT CONTROL UNIT FOR SUPPORT. POSITION AND SECURE BOTH ACTUATORS FOR FREE MOVEMENT TO FULL STROKE. UNCAP THE LOW PRESSURE RELIEF VALVE AND ROUTE OVERBOARD. CONNECT THE HYDRAULIC GROUND SERVICER LOW AND HIGH PRESSURE SYSTEM LINES TO THE ENGINE HYDRAULIC PACKAGE. PRECHARGE THE ENGINE HYDRAULIC ACCUMULATOR WITH GN2 TO 1600±25 PSIG.

THE SYSTEM IS LEAKCHECKED TO VERIFY THAT NO EXTERNAL LEAKAGE EXISTS. THE PRECHARGE IS THEN REDUCED TO 300 PSIG (SO THAT THE GROUND SERVICER PUMP MAY SUPPLY FLUID TO THE ENGINE SYSTEM MORE EASILY) AND THE SYSTEM IS PURGED (CIRCULATED THRU THE FLIGHT AND GROUND FILTERS). GAS IS BLED FROM THE ENGINE FLUID SYSTEM. FLUID SAMPLES ARE TAKEN FROM THE GROUND SERVICER AND ENGINE PACKAGE TO ENSURE THE FLUID MEETS CLEANLINESS LEVELS WHICH ARE ACCEPTABLE FOR FLIGHT. THE PRECHARGE IS THEN RAISED TO 1600+25 PSIG AND THE ENGINE FLUID RESERVOIR IS FILLED TO THE PROPER LEVEL AND THE GROUND SERVICER IS DISCONNECTED FROM THE ENGINE PACKAGE.

NOTIFY SUPPORT GROUPS TO SECURE, REDUCE THE PRECHARGE TO 10-15 PSIG.

THIS TEST IS PERFORMED AFTER VEHICLE ERECTION.

ENGINE HYDRAULIC PACKAGE IS SECURED FOR FLIGHT IN LAUNCH COUNTDOWN.

PHASE N/A

TEST REQUIREMENTS
MSFC: 1) 3.1.1.1.1.1
2) 3.1.1.1.1.2

6 REV.	DATE	REASON	Contractor Approval	KSC Approval
D	6/7/74	To Add Documentation Requirements		
C	11/27/72	DELETION OF REFERENCES TO SECTION 4.0		
B	7/12/72	CHANGE MSFC SPEC. 166C TO MSFC SPEC. 166D		
A	2/23/72	NON-HAZARDOUS PER KMI.1710.13A/SF		

7 SIGNATURE OF APPROVAL	8 ORGANIZATION	9 DATE
	CCSD	9/22/71
10 NASA-KSC APPROVAL	11 ORGANIZATION	12 APPROVAL DATE
	LV MEC 2-3	11/12/71

KSC FORM 21-111 (7/67)

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1 TEST TITLE
HYDRAULIC SYSTEM PURGE AND FILL (STANDBY)

2 KSC TEST NUMBER
V-24527

3 EFFECTIVITY
AS REQUIRED

13 LOCATION
VAB or PAD

14 COMPUTER PROG IDENTIFICATION
OAHS

15 EST TEST TIME
16 HOURS

16 SUPPORT REQUIREMENTS

1) S-IB MEASURING
2) CHEMICAL ANALYSIS LABORATORY
3) H. P. GAS
4) GROUND AND VEHICLE POWER
5) FLIGHT CONTROL
6) INDUSTRIAL WATER

17 OTHER APPLICABLE REFERENCE DOCUMENTATION

MSFC SPECIFICATION 166D, 20C85076
TEST AND CHECKOUT REQUIREMENTS, SPECIFICATIONS AND CRITERIA FOR USE AT KSC. 69C06050

18 ITEM CONTINUATION

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
SIVB-B/IB STAGE VENT & RELIEF VALVES CRACK & RESEAT VERIFICATION

2. PSC TEST NUMBER
V-24536

3. EFFECTIVITY
AS-512 & Subs
AS-206 & Subs

4. TEST OBJECTIVE

The purpose of this procedure is to perform a crack & reseat verification of the LOX & LH2 propellant tank vent and relief valves.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT CONTAIN HAZARDOUS OPERATIONS.

1. Pilot seal crack & reseat verification of following components:

A. LOX Vent & Relief Valve P/N 1A48312
B. LOX Non-Propulsive Valve P/N 1B69030
C. LH2 Vent & Relief Valve P/N 1A48257
D. LH2 Latching Relief Valve P/N 1B74535

CONFIGURATION:

Components to be tested in PCOL Lab.

TEST REQUIREMENTS - SAT V - MSFC 1B76996

0.2.3.4.9.5	3.2.1.1
0.2.3.4.10.6	3.2.1.2
0.2.3.7.9.5	3.2.1.3
0.2.3.7.10.6	3.2.1.4

SAT IB - MSFC 1B86721

0.2.4.4.9.4	3.2.1.1
0.2.4.4.10.4	3.2.1.2
0.2.4.6.9.4	3.2.1.3
0.2.4.6.10.4	3.2.1.4

6. REV	DATE	REASON	Contractor Approval	KSC Approval
D	3/16/73	Added Bench Test Reqmts for S-V & S-IB		
C	12/22/72	Added SIB Requirements Ref. MSFC 1B86721	12-22-72	
B	9/8/72	Revised block 3 effectivity, revised block 4, added test requirements to block 5.		
A	6/9/72	Added support requirements to block 16.	/S/W.P.Tonitto	/S/W.G.Mahoney

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
/S/ W. P. Tonitto	MDAC	1-10-72
10. NASA KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
/S/ W. G. Mahoney	LV-MEC-24	1-20-72

KSC FORM 23-336 (7-67)

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

1. TEST TITLE
SIVB-B/IB STAGE VENT & RELIEF VALVES CRACK & RESEAT VERIFICATION

2. PSC TEST NUMBER
V-24536

3. EFFECTIVITY
AS-512 & Subs
AS-206 & Subs

13. LOCATION
VAB

14. COMPUTER PROC. IDENTIFICATION
N/A

15. EST. TEST TIME
16 Hours

16. SUPPORT REQUIREMENTS

None

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

16. ITEM CONTINUATION

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
STAGE REMOVAL FROM VERTICAL STORAGE CELL AND INSTALLATION INTO LOW BAY CHECKOUT. DSV-4B/SAT. 1B, KSC

2. KSC TEST NUMBER
V-24537

3. EFFECTIVITY
209 & SUBS

4. TEST OBJECTIVES

THIS DOCUMENT CONTAINS INSTRUCTIONS TO REMOVE A PREVIOUSLY INSTALLED S-IVB STAGE FROM THE STORAGE CELL AND TO INSTALL STAGE INTO LOW BAY CHECKOUT CELL, NORMAL FLOW.

5. TEST DESCRIPTION/EQUIPMENT STATUS CONFIGURATION

THIS TEST [X] DOES [ ] DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

THE FOLLOWING OPERATIONS ARE INCLUDED:

1. COVER DEFLATION AND REMOVAL OF COVER FROM STAGE.
2. MOVE OF STAGE TO LOW BAY TRANSFER AISLE.
5. REMOVAL OF 310 FORWARD ACCESS KIT.
6. REMOVAL OF FORWARD HANDLING RING.
7. INSTALL 402 FORWARD ACCESS KIT.
8. REINSTALL FORWARD HANDLING RING.
9. REMOVAL OF STORAGE DESICCANT HARDWARE AND INSTALLATION OF NORMAL FLOW DESICCANT HARDWARE.

THE FOLLOWING EQUIPMENT/CONFIGURATION MUST EXIST.

1. STAGE INSTALLED INTO STORAGE CELL.
2. STAGE IS ON STORAGE DESICCANT SYSTEM.

TEST REQUIREMENTS

MSFC: N/A

LTR	DATE	REASON	Contractor Approval	KSC Approval
B	6-8-74	CHANGE EFFEC. TO 209 & SUBS. DELETE ROOF INTERSTAGE	R. G. English	W. J. Johnson
A	7-11-72	Deleted Reference to Saturn V RD	R. G. English	W. J. Johnson

6. PROJECT DIRECTOR APPROVAL	8. ORGANIZATION	9. DATE
E. M. Engley	MDAC	1-25-72
10. KSC QA APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
W. J. Johnson	LV-MEC-24	Jan 25, 1972

KSC FORM 23-336 7/67

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
STAGE REMOVAL FROM VERTICAL STORAGE CELL AND INSTALLATION INTO LOW BAY CHECKOUT. DSV-4B/SAT. 1B, KSC

2. KSC TEST NUMBER
V-24537

3. EFFECTIVITY
209 & SUBS

13. LOCATION
VAB

14. COMPUTER PROC. INDENTIFICATION

15. EST. TEST TIME

16. SUPPORT REQUIREMENTS

SID-24537-D

17. OTHER APPLICABLE REFERENCE DOCUMENTATION
TCP V-24456
TCP V-24455
TCP V-24425

18. ITEM CONTINUATION

160

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KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
IU PNEUMATIC SYSTEM LP BLEED DOWN TEST

2. KSC TEST NUMBER
V-24561

3. EFFECTIVITY
AS-206 & SUBS

4. TEST OBJECTIVES
TO FUNCTIONALLY CHECK THE PNEUMATIC SYSTEM FLOW RATES AND PRESSURES DURING A LOW PRESSURE BLEED DOWN.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

THE PNEUMATIC SYSTEM SPHERES ARE PRESSURIZED TO 1700 PSIG BY REMOTE OPERATIONS FROM THE LCC. THE SPHERES ARE ALLOWED TO STABILIZE A MINIMUM OF 1 HOUR. THE PNEUMATIC SYSTEM FILL VALVES ARE CLOSED AND THE SPHERES PRESSURE BLEED RATE IS MONITORED FOR A MINIMUM OF 2 1/2 HOURS.

CONFIGURATION: VEHICLE ERECTED WITH STAGE POWER APPLIED.

PHASE: V

TEST REQUIREMENTS

MSFC: 7921601
0.3.5.2.8
0.3.5.2.8.1
0.3.5.2.8.1.1
0.3.5.2.8.2
0.3.5.3.4.1
0.3.5.3.4.2
0.3.5.3.4

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
B	8-6-4	REVISED BLOCKS 3, 5 AND 17	D.F.R. Ring	P. Schmid
A	1-3-73	REVISED TEST REQUIREMENTS	G.E. LECKIE	P. SCHMID

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
S/G.E. LECKIE	IBM - K73	JUNE 30, 1972
10. NASA KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
S/PAUL W. SCHMID	LV-MEC-25	JUNE 30, 1972

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
IU PNEUMATIC SYSTEM LP BLEED DOWN TEST

2. KSC TEST NUMBER
V-24561

3. EFFECTIVITY
AS-206 & SUBS

13. LOCATION
LC 39A, B, C

14. COMPUTER PROG. INDENTIFICATION
N/A

15. EST. TEST TIME
~0 HOURS

16. SUPPORT REQUIREMENTS

INTERSTAGE: SIVB STAGE POWER (NOT APPLICABLE FOR 513 & 515)

OFF-COMPLEX: N/A

ON-COMPLEX:
IBM QA
IU STAGE POWER
HP GAS
OIS
MEASUREMENTS
DDAS
IBM MECHANICAL

17. OTHER APPLICABLE REFERENCE DOCUMENTATION
7921601 10Z22204
MSFC-MAN-014
MSFC-MAN-008

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
STAGE PREPARATION, ORDNANCE INSTALLATION AND TRANSPORTATION TO PAD, SATURN IB

2. KSC TEST NUMBER
V-24562

3. EFFECTIVITY
206 & Subs

4. TEST OBJECTIVES

PREPARE THE S-IVB-IB STAGE FOR ORDNANCE INSTALLATION AND TRANSFER FROM THE VAB TO THE PAD.

5. TEST DESCRIPTION/EQUIPMENT STATUS/CONFIGURATION

THIS TEST [X] DOES [ ] DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

1. CLEAR FORWARD AND AFT ACCESS KITS OF ALL UNNECESSARY EQUIPMENT AND VERIFY THAT THE KITS ARE PROPERLY INSTALLED AND SECURED.
2. VERIFY MODEL DSV-4B-357 PLATFORM INSTALLED FOR ORDNANCE INSTALLATION.
3. VERIFY EXTERNAL PLATFORMS AVAILABLE FOR ORDNANCE INSTALLATION.
4. VERIFY GROUNDING AND CLEANING PREPS FOR ORDNANCE INSTALLATION.
5. VERIFY FAIRINGS AND TUNNEL COVERS ARE INSTALLED.
6. INSURE THAT THE BLANKET PRESSURE OR DESICCANTS ARE ON THE TANKS PER PROPULSION PROCEDURE V-24462 OR V-24447, STATIC DESICCANT PROCEDURE.
7. VERIFY THAT THE THRUST STRUCTURE DOORS AND AFT INTERSTAGE DOOR HAVE BEEN INSTALLED.
8. VERIFY THE SAFETY LOCKS HAVE BEEN INSTALLED ON THE FORWARD AND AFT UMBILICAL CARRIERS.
9. VERIFY FORWARD AND AFT SWING ARM TIPS HAVE BEEN RETRACTED FROM THE VEHICLE; VERIFY MDAC RESPONSIBLE EQUIPMENT ON LUT IS SECURED AND POLICED.
10. VERIFY EQUIPMENT BETWEEN STAGE AND EXTENSIBLE PLATFORM "B" AND "C" ARE REMOVED AND THE STAGE IS READY TO MOVE TO THE PAD.

EQUIPMENT STATUS/CONFIGURATION

S-IVB STAGE HIGH BAY CHECKOUT COMPLETE

TEST REQUIREMENTS
NONE

6. REV.	DATE	REASON	Contractor Approval	KSC Approval

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
R.O. English	MDAC	7-12-72
10. NASA-KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
[illegible] 7-12-72	LV-MEC-24	7/17/2

KSC FORM 23-328 (7/67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
STAGE PREPARATION, ORDNANCE INSTALLATION AND TRANSPORTATION TO PAD, SATURN IB

2. KSC TEST NUMBER
V-24562

3. EFFECTIVITY
206 & Subs

13. LOCATION	14. COMPUTER PROC. INDENTIFICATION	15. EST. TEST TIME
VAB HIGH BAY	N/A	12 HOURS

16. SUPPORT REQUIREMENTS

NONE

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
S-IB STAGE REMOVAL FROM STORAGE

2. KSC TEST NUMBER
V-24579

3. EFFECTIVITY
AS-209 & AS-210

4. TEST OBJECTIVES

PERFORM SPECIAL OPERATIONS REQUIRED TO REMOVE THE S-IB STAGE FROM THE STORAGE TENT.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST __ DOES XX DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

1. DEFLATE TENT.
2. DISMANTLE FUEL AND LOX TANK PRESSURIZATION SYSTEM. (AS 209 ONLY).
3. DISMANTLE STORAGE ENCLOSURE AND CONTROLS.
4. REMOVE VEHICLE FROM TENT.
5. INSTALL THE FLAME SHIELD SUPPORT ASSEMBLY.
6. INSTALL O/B ENGINE FLAME CURTAINS.
7. INSTALL ENVIRONMENTAL AND PROTECTIVE COVERS.

THIS PROCEDURE WILL BE ACCOMPLISHED WITH THE VEHICLE IN A VERTICAL AND HORIZONTAL CONFIGURATION.

PHASE: N/A

TEST REQUIREMENTS
N/A

6. REV	DATE	REASON	Contractor Approval	KSC Approval

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
[signature]	CCSD 6912	6-25-74
10. NASA KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
[signature]	KV MEC 23	1 July 74

KSC FORM 21-338 7-67

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
S-IB STAGE REMOVAL FROM STORAGE

2. KSC TEST NUMBER
V-24579

3. EFFECTIVITY
AS-209 & AS-210

13. LOCATION
VAB

14. COMPUTER PROG. IDENT. NO.
N/A

15. EST. TEST TIME
48 HOURS

16. SUPPORT REQUIREMENTS

(1) Rocketdyne

17. OTHER APPLICABLE REFERENCE DOCUMENTATION
60C11002 S-IB STAGE STORAGE PLAN AT KSC
PEV-1164
R-3620-4 60C12272

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

2. TEST NUMBER: V-26491

GSCU FILL, DRAIN AND COOLANT TRANSFER

3. EFFECTIVITY: AS-209 & SUBS/AS-512 & SUBS

4. TEST OBJECTIVE

A. TO FILL A GROUND SUPPORT COOLING UNIT WITH COOLANT.
B. TO DRAIN COOLANT FROM GROUND SUPPORT COOLING UNIT.
C. TO TRANSFER COOLANT FROM GSCU TO COOLANT LINES AND/OR TRANSFER COOLANT LINES TO A GSCU.
D. TO GN2 LEAK TEST AND COOLANT FILL SWING ARM OAT LINES.

THE COOLANT USED IS OPTIONAL FLO-COOL 100.

5. TEST RESULTS ON EQUIPMENT STATUS CONFIGURATION

THIS TEST DOES X DOES NOT CONTAIN HAZARDOUS OPERATIONS.

THIS PROCEDURE IS DIVIDED INTO FOUR PARTS:

PART I GSCU IS FILLED BY TRANSFERRING COOLANT FROM A SUPPLY CONTAINER INTO COOLANT RESERVOIR.

PART II COOLANT IS DRAINED FROM GSCU USING GSCU PUMP AND GN2 SYSTEMS. GRAVITY DRAIN MAY ALSO BE USED.

PART III COOLANT IS TRANSFERRED FROM GSCU USING GSCU PUMP INTO COOLANT LINES, AND/OR COOLANT IS TRANSFERRED FROM COOLANT LINES USING GN2 INTO A GSCU.

PART IV LEAK CHECK AND COOLANT FILL OF SWING ARM OAT LINES.

APPENDIX A COOLANT DRAIN IN SUPPORT OF LAB OPERATIONS.

CONFIGURATION: GSCU INSTALLED ON THE UMBILICAL TOWER.

PHASE: IB

TEST REQUIREMENTS

MSFC: N/A

NO.	DATE	REASON	Contractor Approval	KSC Approval
	1-20-70	REVISED BLOCKS 3, 4 AND 5	[signature]	[signature]
	2-[illegible]-70	REVISED BLOCKS 5 AND 16	G.E. LECKIE	P.W. SCHMID
	2-[illegible]-70	REVISED BLOCKS 3, 5 AND 16	G.E. LECKIE	P.W. SCHMID
	2-[illegible]-70	REVISE BLOCK 16	G.E. LECKIE	P.W. SCHMID

7. PREPARED BY	8. ORGANIZATION	9. DATE
J. E. SCHMIDT	IBM - 906	FEBRUARY 25, 1970
10. APPROVED BY	11. ORGANIZATION	12. APPROVAL DATE
P. W. SCHMID	LV-MEC-24	FEBRUARY 25, 1970

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APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET 2)

PAGE 2 OF 2

1. TITLE: GSCU FILL, DRAIN AND COOLANT TRANSFER

2. TEST NUMBER: V-26491

3. EFFECTIVITY: AS-209 & SUBS AS-512 & SUBS

13. LOCATION: LC 39

14. COMPUTER PROG IDENTIFICATION: N/A

15. EST. TEST TIME: 2 MEN - 3 HOURS

16. SUPPORT REQUIREMENTS

	SID - 26491-1
INTERSTAGE	NONE
OFF - COMPLEX	BENDIX
ON COMPLEX	IBM QA IBM MECHANCIAL LV-QUAL

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

7919372-001

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
ORONITE SAMPLING

2. KSC TEST NUMBER
V-26492

3. EFFECTIVITY
AS-209 & SUBS

4. TEST OBJECTIVE

TO VERIFY COOLANT USED IN IU/SIVB THERMAL CONDITIONING SYSTEM MEETS REQUIREMENTS. COOLANT USED IS ORONITE FLO-COOL 100.

5. DESCRIPTION OF EQUIPMENT STATUS CONFIGURATION

THIS TEST DOES X DOES NOT CONTAIN HAZARDOUS OPERATIONS.

THIS PROCEDURE IS DIVIDED INTO TWO PARTS:

PART I GROUND SYSTEM VALIDATION SAMPLING
PART II PRIMARY LOOP SAMPLE

CONFIGURATION: N/A

TEST REQUIREMENTS
AS-200 & SUBS

MSFC: 7921601

0.3.5.2.6.1.1
0.3.5.2.6.1.1.1
0.3.5.2.6.1.1.2
0.3.5.2.6.1.1.2.1
0.3.5.2.6.1.1.2.2
0.3.5.2.6.1.1.2.3
0.3.5.2.6.1.1.3
0.3.5.2.6.1.2
0.3.5.2.6.1.2.1
0.3.5.2.6.1.2.2
0.3.5.2.6.1.2.3

APPLICABLE:
IB, III, IV, V, VI

NO.	DATE	REASON	Contractor Approval	KSC Approval
E	7-15-71	REVISED BLOCKS 3 AND 5	J. R. Rizzo 7/12/71	
D	4-30-71	REVISE BLOCK 5	J. E. Lechic 4-30-71	
C	4-17-72	REVISED BLOCKS 3, 5, & 16	J. E. Lechic 4/19/72	
B	4-8-70	UPDATE MSFC REQTS. REF RSCC 53	D. E. Lechic 4/8/70	

6. SUBMITTED FOR APPROVAL BY
[signature] 3/5/70

7. ORGANIZATION
IBM - K73

8. DATE
MARCH 5, 1970

9. APPROVED BY
[signature]

10. ORGANIZATION
AA-MEC-35

11. APPROVAL DATE
3/5/70

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
ORONITE SAMPLING

2. KSC TEST NUMBER
V-26492

3. EFFECTIVITY
AS-209 & SUBS

13. LOCATION
LC39

14. COMPUTER PROC. INDENTIFICATION
N/A

15. EST. TEST TIME
N/A

15. SUPPORT REQUIREMENTS

INTERSTAGE: NONE

OFF-COMPLEX: BENDIX

ON-COMPLEX: IBM QA
IBM MECHANICAL
LV QUAL

17. OTHER APPLICABLE REFERENCE DOCUMENTATION
7919372-1

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

GSCU & FCVB FUNCTIONAL TEST (STANDBY)

2. KSC TEST NUMBER: V-26497

3. EFFECTIVITY: AS REQUIRED

TO VERIFY THE GROUND SUPPORT COOLING UNIT (GSCU), FLOW CONTROL VALVE BOX (FCVB), AND SERVICE LINES ARE OPERATIONAL.

THIS TEST DOES ☒ DOES NOT CONTAIN HAZARDOUS OPERATIONS

1. THE GSCU'S, FCVB, AND ASSOCIATED LINES ARE SYSTEMATICALLY INSPECTED TO VERIFY ALL LINES, FITTINGS, ETC. ARE PROPERLY CONNECTED.
2. THE FCVB IS CYCLED AND THE FCVB TEST SET INDICATORS ARE MONITORED FOR PROPER OPERATION.
3. LINES ARE INCREMENTALLY PRESSURIZED TO 50 PSIG WITH GN2 AND ARE LEAK CHECKED USING LEAK DETECTOR SOLUTION.
4. PRESSURE DECAY CHECKS ARE MADE AT 50 PSIG TO INSURE INTEGRITY.
5. GSCU IS TESTED TO VERIFY PRESSURES, FLOW RATES, AND TEMPERATURES.
6. [illegible] GAS BYPASS, [illegible] AND LOW PRESSURE CUTOUT SWITCHES, AND PNEUMATIC [illegible] ARE FUNCTIONALLY TESTED.
7. THE UNITS ARE OPERATED WITH FLOW THROUGH THE HEAT LOAD SIMULATOR TO VERIFY TEMPERATURE MAY BE STABILIZED WITH A VARYING HEAT LOAD.

CONFIGURATION: INSTALLED ON THE LUT WITH GROUND POWER AND FACILITY GN2 APPLIED.

REV	REASON	TEST REQUIREMENTS	Contractor Approval	KSC Approval
		N/A		
	SEE BLOCK 18 FOR REV. HISTORY CONTINUATION			
	REV. TO CHARLIENS TEST			
	REVISED BLOCKS 3, 5, AND 16			
	[illegible]			

[illegible] OPERATION

[illegible] DATE: 6/15/70

[illegible] APPROVAL DATE

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE: GSCU & FCVB FUNCTIONAL TEST (STANDBY)

2. KSC TEST NUMBER: V-26497

3. EFFECTIVITY: AS REQUIRED

13. LOCATION: LC39

14. COMPUTER PROG. IDENTIFICATION: N/A

15. EST. TEST TIME: 2 MEN, 30 HOURS

16. SUPPORT REQUIREMENTS

1. INTERSTAGE REQUIREMENTS: N/A
2. OFF-COMPLEX SUPPORT: NONE
3. ON-COMPLEX SUPPORT: IBM QA
   IBM MECHANICAL

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

MSFC-MAN-008 IBM NO-JB20007
MSFC-SPEC-164 MC-245

18. ITEM CONTINUATION

D	4/2/73	REVISED BLOCKS 1 & 3	[illegible] 4-4-73	[illegible]
E	7/17/74	REVISED BLOCKS 13 & 17	[illegible] 7/26/74	[illegible]

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE

S-IB HOLDDOWN ARM QUALIFICATION TEST

2. KSC TEST NUMBER
V-26532

3. EFFECTIVITY
206 & Subs

4. TEST OBJECTIVES

THE OBJECTIVE OF THIS TEST IS TO VERIFY THE ENTIRE HDA SYSTEM IS FUNCTIONALLY ACCEPTABLE TO SUPPORT LAUNCH.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

PART I

The separator flex hoses are plugged and the panel is actuated from the firing accessories control console, in the LCC, to verify panel operation and to leak check the final panel connections.

PART II

The HDA pneumatic system is connected in such a way as to check the reverse flow in the separator check valves. The release valves are operated independantly to verify proper operation. The primary and secondary pneumatic drops are performed from the firing accessories control console, the release valve and arm release times are recorded and final leak checks achieved.

PART III

The final drop is considered a flight configuration drop. All explosives are simulated and all times recorded. The system is returned to a standby configuration ready for testing and launch.

CONFIGURATION: Vehicle is in a vertical mated position.

TEST REQUIREMENTS
MSFC - N/A

REV.	DATE	REASON	Contractor Approval	KSC Approval
C	4-12-78	Deletion of explosive release changes the hazard level	[illegible]	[illegible]
B	12/15/78	Explosive Release Requirement Deleted	[illegible]	[illegible]
A	6/20/72	Effectivity changed per TL-2-17, Rev F	S/A L. H. Childers	S/A GHR 6/27/72

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
S/A Gene P. Gorrell	CCSD	3-24-71
10. KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
S/A G. H. Robinson	LV-MEC-12	3-25-71

KSC FORM 23-134 (7/67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE

S-IB Holddown Arm Qualification Test

2. KSC TEST NUMBER
V-26532

3. EFFECTIVITY
206 & Subs

13. LOCATION
ML

14. COMPUTER PROC. INDENTIFICATION
N/A

15. EST. TEST TIME
32 Hrs.

16. SUPPORT REQUIREMENTS

DEE-6

Vehicle Networks

RCA 110A Computer

Ground Networks

OIS

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

TM-627 HOLDDOWN ARM O&M MANUAL
75M01821 HOLDDOWN ARM ASSEMBLY

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1 TEST TITLE
VACUUM PUMP
P M AND CHECKOUT

2 KSC TEST NUMBER
V-26533

3 EFFECTIVITY
GSE-LC-39

4 TEST OBJECTIVES
To maintain the KC-8R,KC-8D, and KTC-21D vacuum pumps in optimum operation condition.

5 TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST [ ] DOES [X] DOES NOT CONTAIN HAZARDOUS OPERATIONS.

Prime test organization is propellants.

Perform operational checkout and preventive maintenance on vacuum pumps.

PHASE N/A

TEST REQUIREMENTS

N/A

CANCELLED

6 REV	DATE	REASON	Contractor Approval	KSC Approval
A	[illegible]	CANCELL - NO LONGER REQUIRED	A. C. Motley	[signature]

7 CONTRACTOR APPROVAL	8 ORGANIZATION	9. DATE
A. C. Motley	CCSD	3/26/71
10 NASA/KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
[signature]	LV-MCC-32	3/26/71

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1 TEST TITLE
VACUUM PUMP
P M AND CHECKOUT

2 KSC TEST NUMBER
V-26533

3 EFFECTIVITY
GSE LC-39

13 LOCATION
Shop (VAB)

14 COMPUTER PROC IDENTIFICATION
N/A

15 EST TEST TIME
One (1) Day

16 SUPPORT REQUIREMENTS

NONE

17 OTHER APPLICABLE REFERENCE DOCUMENTATION

(A) Kinney Corp.; KC-8 Service Manual
(B) Kinney Corp.; KTC-21 Service Manual

18 ITEM CONTINUATION

CANCELLED

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
IU AIRCRAFT LOADING

2. KSC TEST NUMBER
V-26546

3. EFFECTIVITY
AS REQUIRED

4. TEST OBJECTIVES
LOAD IU ON SUPER GUPPY AIRCRAFT

5. TEST DESCRIPTION/EQUIPMENT STATUS/CONFIGURATION (REPLACES IV-26008)

THIS TEST [X] DOES [ ] DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

THE IU IS LOADED ONTO THE ADAPTER THAT HAS BEEN PREVIOUSLY FASTENED TO THE CARGO LIFT TRAILER. BOLTS ARE INSTALLED TO FASTEN IU TO ADAPTER AND THEN THE HOISTING SLING IS DISCONNECTED.

THE CLT IS ALIGNED WITH SUPER GUPPY AIRCRAFT, AND GENERAL PURPOSE PALLET WITH IU IS LOADED INTO THE AIRCRAFT. THE PALLET IS THEN SECURED IN THE AIRCRAFT, THE CLT REMOVED, AND THE AIRCRAFT SECURED FOR FLIGHT.

TEST REQUIREMENTS

MSFC: N/A

6. REV.	DATE	REASON	Contractor Approval	KSC Approval

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
[signature]	IBM - K73	June 21, 1971
10. NASA-KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
[signature]	LV-NEC-25	June 21, 1971

KSC FORM 23-339 (7/67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
IU AIRCRAFT LOADING

2. KSC TEST NUMBER
V-26546

3. EFFECTIVITY
AS REQUIRED

13. LOCATION
SKID STRIP

14. COMPUTER PROC. INDENTIFICATION
N/A

15. EST. TEST TIME
6 MEN -- 12 MAN HOURS

16. SUPPORT REQUIREMENTS

INTERSTAGE: NONE

OFF-COMPLEX: RD 40090-3F

ON-COMPLEX: IBM QA
IBM MECHANICAL
KSC SAFETY
PAA SAFETY

17. OTHER APPLICABLE REFERENCE DOCUMENTATION
90M01996 SK-95-573
90M01969
R-TEST-V-102

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE: IU HANDLING EQUIPMENT P/M

2. KSC TEST NUMBER: V-26547

3. EFFECTIVITY: GSE

4. TEST OBJECTIVES

MAINTAIN THE IU HOISTING SLINGS AND COMPONENT HANDLING EQUIPMENT IN A CLEAN PRESERVED OPERABLE CONDITION.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION (REPLACES IV-26013)

THIS TEST X DOES ___ DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

A. SEMI-ANNUAL PREVENTIVE MAINTENANCE IS PERFORMED ON:

1. IU COMPONENT HANDLING EQUIPMENT
2. IU (ERECTION) SLING HT-322-13000
3. IU PROTECTIVE COVER HOISTING CABLE (V36048)

B. PREVENTIVE MAINTENANCE CONSISTS OF:

1. HANDLING EQUIPMENT GENERAL MAINTENANCE
2. HOISTING EQUIPMENT ADJUSTMENT PROCEDURE
3. HOISTING EQUIPMENT PROOFLOADING PROCEDURE

CONFIGURATION: LABORATORY

TEST REQUIREMENTS

MSFC: N/A

PHASE: N/A

[illegible] REVISE BLOCKS 5 AND 17		[signature] 6/15/71	[signature]
NO.	DATE	REASON	Contractor Approval	KSC Approval

PREPARED BY: [signature]	8. ORGANIZATION: IBM/K73	9. DATE: June 21, 1971
TECH. APPROVAL: [signature]	11. ORGANIZATION: [illegible]	12. APPROVAL DATE: June 21, 1971

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE: IU HANDLING EQUIPMENT P/M

2. KSC TEST NUMBER: V-26547

3. EFFECTIVITY: GSE

13. LOCATION: LABORATORY

14. COMPUTER PROC. IDENTIFICATION: N/A

15. EST. TEST TIME: 2 MEN, 6 MAN HOURS

16. SUPPORT REQUIREMENTS

INTERSTAGE REQUIREMENTS: N/A

OFF-COMPLEX SUPPORT: BENDIX WIRE ROPE SHOP

ON-COMPLEX SUPPORT: IBM QA
IBM SAFETY
LV-QAL
KSC SAFETY

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

KSC-STD-S-0001 B
DRAWING HT-322-13000

18. ITEM CONTINUATION

170

REV 32

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
IU CORROSION INSPECTION

2. KSC TEST NUMBER
V-26548

3. EFFECTIVITY AS-209 & SUBS

4. TEST OBJECTIVES

TO THOROUGHLY INSPECT THE INSTRUMENT UNIT EXTERIOR, INTERIOR, TUBING/FLEXHOSES/ FITTINGS, COLD PLATES AND COMPONENTS FOR:

1. ANY EVIDENCE OF CORROSION OR MATERIAL DETERIORATION.

2. ANY EVIDENCE OF STRESS CORROSION CRACKING IN PARTS SUSCEPTIBLE.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST ___ DOES XX DOES NOT CONTAIN HAZARDOUS OPERATIONS.

1. INSPECTION OF ALL STRESS CORROSION SUSCEPTIBLE PARTS WILL BE PERFORMED WITHIN 97 DAYS FOLLOWING:

(A) LAST STRESS CORROSION INSPECTION PRIOR TO IU SHIPMENT TO KSC.

(B) POST-STORAGE STRESS CORROSION INSPECTION, IF IU WAS PREVIOUSLY IN LONG-TERM STORAGE AT KSC.

2. SUBSEQUENT STRESS CORROSION INSPECTION(S) WILL BE PERFORMED AT 90 ± 7 DAY INTERVALS, WITH THE FINAL INSPECTION OCCURRING WITHIN 30 DAYS OF LAUNCH.

3. IN ADDITION, A COMPREHENSIVE CORROSION/MATERIAL DETERIORATION INSPECTION WILL BE PERFORMED ON THE IU STRUCTURE, UMBILICAL, CABLE TRAY, BRACKETING, TCS/GN2 SYSTEM TUBING & COMPONENTS AND COMPONENT/COLD PLATE INTERFACES. THIS INSPECTION WILL BE PERFORMED COINCIDENT WITH STRESS CORROSION INSPECTION WHERE PRACTICABLE, BUT IS SPECIFICALLY DESIGNED FOR PERFORMANCE ONCE PRIOR TO ROLL-OUT AND SUBSEQUENTLY ONCE WITHIN 30 DAYS PRIOR TO LAUNCH.

CONFIGURATION: CABLE TRAY INSPECTION REQUIRES REMOVAL OF HYPERGOL PROTECTION CABLE TRAY COVERS.

PHASE - SEE BLOCK 18 TEST REQUIREMENTS - SEE BLOCK 18

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
C	7-31-74	REVISED BLOCKS 3, 17 AND 18	S X Riley	
B	2/1/74	REVISED BLOCKS 3, 4, 5 AND 17	J. E. Lemon	
A	4/7/72	REVISED BLOCKS 1, 3, 5, 13 AND 16	G. E. LECKIE	P. W. SCHMID

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
G. E. LECKIE	IBM - K73	6-21-71
10. NASA KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
PAUL W SCHMID	LV-MEC-25	6-1-71

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
IU CORROSION INSPECTION

2. KSC TEST NUMBER
V-26548

3. EFFECTIVITY AS-209 & SUBS

13. LOCATION
MAB, LC39

14. COMPUTER PROC. INDENTIFICATION
N/A

15. EST. TEST TIME
4 MEN - 10 HOURS

16. SUPPORT REQUIREMENTS

INTERSTAGE REQUIREMENTS: NONE

OFF-COMPLEX SUPPORT: NONE

ON-COMPLEX SUPPORT: IBM QA
LV QAL
IBM MECHANICAL
IBM NETWORKS

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

10Z22204-1 (SAT 1B)	30Z13100-1	30Z13106-1	7914561-1	20Z42023-1
TM-011-001-2H	30Z13104-1	11Z00055-5 (SAT IB)		7910120-3
7921601	30Z13105-1	7921601		30Z13107-1

18. ITEM CONTINUATION

PHASE: IV, V, VI

TEST REQUIREMENTS

MSFC: 7921601 TM-011-001-2H

0.3.3.2.1 B.1.3.4
0.3.3.2.1.1
0.3.3.2.2

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE: EQUIPMENT PRESSURIZATION

2. KSC TEST NUMBER: V-26549

3. EFFECTIVITY: AS-206 & SUBS

4. TEST OBJECTIVES

TO PRESSURIZE TEST EQUIPMENT WITH GN2, INCLUDING THE STAGE-MOUNTED INTERSTAGE SEPARATION SIMULATOR (SAVAGE SAM), IU STAGE COMPONENTS, IU PRESSURIZED LIGHTING SYSTEM AND IU OIS BOXES.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST X DOES DOES NOT CONTAIN HAZARDOUS OPERATIONS.

EQUIPMENT PRESSURIZATION

THE 750 PSIG GN2 PRESSURE SOURCE, PURGE SUPPLY IS SUPPLIED TO THE END OF THE SWING ARM. THE INLET OF A REGULATED TEST PANEL IS CONNECTED TO THE GN2 SUPPLY, AT THE SWING ARM BY A FLEX HOSE. EQUIPMENT TO BE PRESSURIZED IS CONNECTED TO THE OUTLET OF THE REGULATED TEST PANEL WITH A FLEX HOSE AND PRESSURIZED.

LIGHT & IU OIS BOX PRESSURIZATION

THE GN2 PRESSURE SOURCE, SUPPLIED FROM THE GN2 PURGE PANEL (750 PSI OUTLET) FOR SATURN V, TO THE END OF THE SWING ARM. THE INLET OF A REGULATED TEST PANEL IS CONNECTED TO THE GN2 SUPPLY AT THE SWING ARM BY A FLEX HOSE. THE IU OIS BOXES ARE CONNECTED TO THE OUTLET OF THE REGULATED TEST PANEL WITH FLEX HOSES. THE LIGHTING SYSTEM PRESSURE CONTRROL BOX IS CONNECTED TO THE OUTLET OF THE REGULATED TEST PANEL WITH A FLEX HOSE AND IS USED TO CONTROL THE PRESSURE IN THE LIGHTING SYSTEM.

PHASE: VI

TEST REQUIREMENTS

NONE

REV	DATE	REASON	Contractor Approval	KSC Approval
D	8-6-4	REVISED BLOCKS 3, 5 AND 17	D.K.R. Long	P. Schmid
C	1-31-3	REVISED MSFC REQUIREMENTS & BLOCK 17	G.E. LECKIE	P. SCHMID
B	11-7-2	REVISED BLOCKS 5 AND 16	G.E. LECKIE	P. SCHMID
A	-19-72	REVISED BLOCKS 3, 5, 16 AND 17	G.E. LECKIE	P. SCHMID

7. CONTRACTOR APPROVAL: G.E. LECKIE
8. ORGANIZATION: IBM - K73
9. DATE: JUNE 21, 1971
10. NASA KSC APPROVAL: PAUL W. SCHMID
11. ORGANIZATION: LV-MEC-25
12. APPROVAL DATE: JUNE 21, 1971

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE: EQUIPMENT PRESSURIZATION

2. KSC TEST NUMBER: V-26549

3. EFFECTIVITY: AS-206 & SUBS

13. LOCATION: LC 39

14. COMPUTER PROC. INDENTIFICATION: N/A

15. EST. TEST TIME: 2 MEN 2 MAN HOURS

16. SUPPORT REQUIREMENTS

SID-Y-26549I (AS-206 & SUBS)
RD 40092-3BB (AS-512 & SUBS)

INTERSTAGE REQUIREMENTS: N/A

OFF-COMPLEX SUPPORT: N/A

ON-COMPLEX SUPPORT:
IBM QUALITY ASSURANCE
HP GAS
KSC SAFETY
IBM MECHANICAL

17. OTHER APPLICABLE REFERENCE DOCUMENTATION
T.O. 00-25-223 7921601
TM-542
TM-475

18. ITEM CONTINUATION

REV 32

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KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
IU STORAGE AND MAINTENANCE

2. KSC TEST NUMBER
V-26682

3. EFFECTIVITY
AS-209 & SUBS

4. TEST OBJECTIVES
TO VERIFY THE IU ENVIRONMENT AND PHYSICAL CONDITION REMAIN WITHIN SPECIFIC REQUIREMENTS DURING THE STORAGE PERIOD.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST [X] DOES [ ] DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

THIS PROCEDURE SPECIFIES THE REQUIREMENTS TO BE MAINTAINED ON THE IU WHILE IN STORAGE BY PERFORMANCE OF THE FOLLOWING TASK AT SPECIFIED INTERVALS.

VERIFICATION OF TEMPERATURES ON DAILY BASIS.
VAPOR BARRIER HUMIDITY CHECKS WEEKLY.
VAPOR BARRIER AIR SAMPLE AT 3 MONTH INTERVALS.
IU CORROSION INSPECTION AND VERIFICATION OF FLATNESS AT 6 MONTHS.

TEST REQUIREMENTS

N/A

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
A	2-11-74	REVISED BLOCKS 3 AND 17		

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
		12-11-73
10. NASA-KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
		12 11-73

KSC FORM 23-338 (7-67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
IU STORAGE AND MAINTENANCE

2. KSC TEST NUMBER
V-26682

3. EFFECTIVITY
AS-209 & SUBS

13. LOCATION
MSOB

14. COMPUTER PROC. INDENTIFICATION
N/A

15. EST. TEST TIME
2 MEN, 1500 HOURS

16. SUPPORT REQUIREMENTS

INTERSTAGE: N/A

OFF-COMPLEX: BENDIX SAMPLING

ON-COMPLEX: O & C HIGH BAY CRANE OPERATOR
KSC SAFETY
IBM QA
IBM MECHANICAL

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

STAGE STORAGE PLAN - DRL LINE ITEM NO. 057

18. ITEM CONTINUATION

REV 31

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
IU REMOVAL FROM LONG TERM STORAGE

2. KSC TEST NUMBER V-26683

3. EFFECTIVITY AS-209 & SUBS

4. TEST DESCRIPTION

TO TERMINATE IU LONG TERM STORAGE, PERFORM POST STORAGE INSPECTIONS AND TRANSPORT IU FROM O&C BUILDING TO VAB 1L1 TEMPORARY STORAGE AREA.

5. SPECIFIED SYSTEM / EQUIPMENT STATUS CONFIGURATION

THIS TEST X DOES ___ DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

THIS PROCEDURE SPECIFIES THE REQUIREMENTS FOR REMOVAL OF THE IU FROM STORAGE BY PERFORMANCE OF THE FOLLOWING TASKS:

THE VAPOR BARRIER WILL BE REMOVED.

PRIOR TO REMOVAL FROM THE STORAGE STATION THE IU WILL BE CHECKED FOR VERIFICATION OF FLATNESS REQUIREMENT.

A CORROSION INSPECTION WILL BE PERFORMED.

A FASTENER TORQUE CHECK WILL BE PERFORMED.

SHOCK RECORDERS WILL BE INSTALLED ON THE IU AND TRANSPORTER.

THE IU WILL BE POSITIONED ON THE TRANSPORTER AND TRANSPORTED TO VAB 1L1.

THE STORAGE STATIONS WILL BE SECURED AS REQUIRED.

PHASE
N/A

TEST REQUIREMENTS
N/A

NO.	DATE	REASON	Contractor Approval	KSC Approval
2	1-14-74	REVISED BLOCKS 1, 4 AND 5	O. R. Day	P. Schmid
1	1-11-74	REVISED BLOCKS 3 AND 17	J. FAVOR	P. SCHMID

6. PREPARED BY	7. ORGANIZATION	8. DATE	
	IBM - 906	1-14-74	
9. SUBMITTED BY	10. ORGANIZATION	11. APPROVAL DATE	
	LV-MEC-25	1-11-74	

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
IU REMOVAL FROM LONG TERM STORAGE

2. KSC TEST NUMBER V-26683

3. EFFECTIVITY AS-209 & SUBS

13. LOCATION	14. COMPUTER PROG. IDENTIFICATION	15. EST. TEST TIME
O & C AND 1L1	N/A	6 MEN, 350 HOURS

16. SUPPORT REQUIREMENTS

INTERSTAGE: N/A

OFF-COMPLEX: BENDIX SHOPS

ON-COMPLEX: O&C HIGH BAY CRANE OPERATOR
KSC SAFETY
SECURITY
LV-QUAL
IBM QUAL
IU VEHICLE NETS
IBM MECHANICAL

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

STAGE STORAGE PLAN - DRL LINE ITEM NO 057

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
PEAK VOLTAGE MONITOR OPERATION AND INDUCED VOLTAGE DETECTOR INSTALLATION, OPERATION, AND REMOVAL

2. KSC TEST NUMBER
V-27250

3. EFFECTIVITY
512, 206 - 210

4. TEST OBJECTIVES
To provide a procedure to install, functionally operate, and remove the S-IVB Stage Induced Voltage Detection System and to operate the Peak Voltage Monitor GSE System located on the 220' of the Mobile Launcher.

5. TEST DESCRIPTION/EQUIPMENT STATUS/CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT CONTAIN HAZARDOUS OPERATIONS.

This test shall proceed as follows:

1. Install the IVD's and interconnecting cable prior to rollout.
2. Periodically monitor the outputs of the IVD's and PVM for indication of induced voltage and battery status.
3. Replace batteries when required.
4. Remove the IVD's prior to removal of the Aft Access Kit during CDDT.
5. Re-install the IVD equipment upon completion of CDDT.
6. Monitor the outputs as in 2 above.
7. Remove the IVD's and interconnecting cable prior to removal of the Aft Access Kit during Countdown.

MSFC T.R. 1B86721 and 1B76996 Not Applicable

BY	DATE	REASON	Contractor Approval	KSC Approval
B	7-23-74	ADDITION OF VEHICLE 210 EFFECTIVITY		
A	8-21-72	ADDITION OF PEAK VOLTAGE MONITOR OPERATION		

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
S. WHITE	MDAC	8-21-72
10. NASA-KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
S/B D. R. JONES	LV-GDC-23	8-21-72

KSC FORM 23-330 (7/67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
PEAK VOLTAGE MONITOR OPERATION AND INDUCED VOLTAGE DETECTOR INSTALLATION, OPERATION, AND REMOVAL

2. KSC TEST NUMBER
V-27250

3. EFFECTIVITY
512, 206 - 210

13. LOCATION
LC 39

14. COMPUTER PROG. INDENTIFICATION

15. EST. TEST TIME

16. SUPPORT REQUIREMENTS

17. OTHER APPLICABLE REFERENCE DOCUMENTATION
1B72582 Installation, Induced Voltage Detector
1B72584 Cable Assembly, IVD

18. ITEM CONTINUATION

175

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KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1 TEST TITLE
-R035-DC TO DC CONVERTER SPARES CHECKOUT

2. KSC TEST NUMBER
V-27251

3. EFFECTIVITY
AS REQ.

4 TEST OBJECTIVES

To verify the satisfactory operation of the DC to DC converter assembly prior to installation in the S-II stage.

5 TEST DESCRIPTION EQUIPMENT STATUS/CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT CONTAIN HAZARDOUS OPERATIONS.

Using laboratory test equipment, verify the following parameters of converter:

1. Accuracy of output voltage with nominal input voltage.
2. Accuracy of output voltage with under-voltage and over-voltage input.
3. Output voltage stability and current drain under heaviest design load.
4. Ripple voltage present on output level.

TEST REQUIREMENTS: N/A

6. REV.	DATE	REASON	Contractor Approval	KSC Approval

7 CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
W. W. Robinson - 9/05/72	North American Rockwell	5 September 1972
10 NASA-KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
SD	LV-INS-12	9-11-72

KSC FORM 21-118 (OT)

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APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1 TEST TITLE
-R035- DC TO DC CONVERTER SPARES CHECKOUT

2. KSC TEST NUMBER
V-27251

3. EFFECTIVITY
AS REQ.

13 LOCATION	14 COMPUTER PROC. INDENTIFICATION	15. EST. TEST TIME
LCC, 2P10	N/A	2 Hours

16 SUPPORT REQUIREMENTS

RF/TM LAB, LCC, RM. 2P10B

17 OTHER APPLICABLE REFERENCE DOCUMENTATION

MA0205-1113
V7-750347

18 ITEM CONTINUATION

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
Radio Frequency System Test

2. KSC TEST NUMBER
V-28003

3. EFFECTIVITY
GSE

4. TEST OBJECTIVES
To verify performance of the RF portion of the Telemetry Checkout Equipment, including RF patching options.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT CONTAIN HAZARDOUS OPERATIONS.

The following checks will be performed:

- Attenuator check
- Multicoupler checks
- Preamplifier checks
- Receiver power supply voltage checks
- Receiver noise figure checks
- I.F. checks
- Second Local Oscillator checks
- Receiver AGC output checks
- Video output level checks
- Receiver meter checks
- Pre-D down-converter checks

Various patching options will also be exercised.

This procedure also contains receiver alignment sequences to be performed as required.

This procedure is perfromed prior to processing each launch vehicle.

CANCELLED

6. REV.	DATE	REASON	Contractor Approval	KSC Approve
C	9/6/74	Cancel	9-9-74 Steven Dodge	

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
s/Steven H. Dodge	LV-INS-12	
10. NASA KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
s/L. C. Blanchard	LV-INS-12	2-13-72

KSC FORM 23-338B (7/67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
Radio Frequency System Test

2. KSC TEST NUMBER
V-28003

3. EFFECTIVITY
GSE

13. LOCATION
LCC 39

14. COMPUTER PROC. INDENTIFICATION
N/A

15. EST. TEST TIME
80 manhours

16. SUPPORT REQUIREMENTS

LCC Telemetry Checkout Equipment.

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

18. ITEM CONTINUATION

CANCELLED

KSC FORM 23-338C (7/67)

REV 32

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
Frequency Modulation Discriminator Test

2. KSC TEST NUMBER
V-28004

3. EFFECTIVITY
GSE

4. TEST OBJECTIVES

To verify proper operation of the discriminator calibrators and stage module and common module discriminators.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT CONTAIN HAZARDOUS OPERATIONS.

The following tests will be performed:

Calibrator output amplitude, pre-emphasis, center frequency, bandedges and linearity.

Discriminator bandedges, linearity, output level, calibrations, and light indicator operation.

This test will be performed prior to processing each vehicle.

CANCELLED

6 REV.	DATE	REASON	Contractor Approval	KSC Approval
C	9/6/74	Cancel	9-9-74 Steven Dodge	

7 CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
s/Steven H. Dodge	LV-IMS-12	
10. NASA KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
s/L. C. Blanchard	LV-IMS-12	1-03-72

KSC FORM 23-338B (7/67)

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
Frequency Modulation Discriminator Test

2. KSC TEST NUMBER
V-28004

3. EFFECTIVITY
GSE

13. LOCATION

14. COMPUTER PROG. IDENTIFICATION

15. EST. TEST TIME
80 manhours

16. SUPPORT REQUIREMENTS

LCC Telemetry Checkout Equipment.

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

18. ITEM CONTINUATION

CANCELLED

KSC FORM 23-338C (7/67)

REV 32

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE: Tape Recorder Test

2. KSC TEST NUMBER: V-28005

3. EFFECTIVITY: GSE

4. TEST OBJECTIVES

To verify proper operation of Telemetry Checkout Equipment tape recorders.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT CONTAIN HAZARDOUS OPERATIONS.

The following tests will be performed:

Capstan speed , wow and flutter, and tape transport control operation.

Operation of reproduce heads and amplifiers.

Operation of record heads and amplifiers.

System performance in recording and reproducing test signals.

Verify bi-directional operation capability.

Normal switching and patching operations will be exercised.

This procedure is performed prior to processing each launch vehicle.

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
C	9/10/74	Release for ASTP	9-10-74 Steven H. Dodge	

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
s/Steven H. Dodge	LV-INS-12	1/03/72
10. NASA-KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
s/L. C. Blanchard	LV-INS-12	2/22/72

KSC FORM 23-338C (7/67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE: Tape Recorder Test

2. KSC TEST NUMBER: V-28005

3. EFFECTIVITY: GSE

13. LOCATION: LCC 39

14. COMPUTER PROC. INDENTIFICATION:

15. EST. TEST TIME: 80 manhours

16. SUPPORT REQUIREMENTS

LCC Telemetry Checkout Equipment

LCC TCE Magnetic Tape Recording

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

18. ITEM CONTINUATION

KSC FORM 23-338C (7/67)

REV 32

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
Telemetry Checkout Equipment
PCM/DDAS Test

2. KSC TEST NUMBER
V-28008

3. EFFECTIVITY
GSE

4. TEST OBJECTIVES

To verify operational readiness of the TRS-1 Digital Receiving Stations

5. TEST DESCRIPTION EQUIPMENT STATUS/CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT CONTAIN HAZARDOUS OPERATIONS.

The following checks will be performed:

Check panel meters of the power supply panel for proper voltage and current indications.

Verify proper operation of the digital signal simulator, checking clock timing, external sync output, 600 KHZ modulated output, NRZ-S data output and sync word configuration.

Using the digital signal simulator, verify proper operations of the synchronizer, correlator, data control, data switch, and output registers. Verify all bit and mode options, and verify operation of the quick-look panel meters.

Verify proper operating voltages for each D/A converter, verify proper operation of the DAC calibrator, and verify proper operation and calibration of each D/A converter.

This procedure is performed prior to processing each launch vehicle.

CANCELLED

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
C	9/6/74	Cancel	9-9-74 Steven Dodge	L. C. Blanchard

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
s/Steven H. Dodge	LV-INS-12	
10. NASA-KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
s/ L. C. Blanchard	LV-INS-12	1-31-72

KSC FORM 23-338B (7/67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
Telemetry Checkout Equipment
PCM/DDAS Test

2. KSC TEST NUMBER
V-28008

3. EFFECTIVITY
GSE

13. LOCATION	14. COMPUTER PROC. INDENTIFICATION	15. EST. TEST TIME
LCC39	N/A	40 manhours

16. SUPPORT REQUIREMENTS

LCC Telemetry Checkout Equipment

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

18. ITEM CONTINUATION

CANCELLED

KSC FORM 23-338C (7/67)

REV 32

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KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
Telemetry Checkout Equipment
Readiness Test

2. KSC TEST NUMBER
V-28009

3. EFFECTIVITY
GSE

4. TEST OBJECTIVES

To verify operational readiness of the Common Module, CIF Interface, Room Entry Patch Rack, and Stage Module PCM Synchronizers.

5. TEST DESCRIPTION EQUIPMENT STATUS/CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT CONTAIN HAZARDOUS OPERATIONS.

The following tests will be performed:

Receiver checks
Discriminator checks
Oscillograph Recorder checks
Pen Recorder checks
Tape Recorder checks
Pre-D Demodulator checks
CIF Interface Test
Test Patching
TRS-1 checks

This test will be performed prior to vehicle tests requiring TCE Support.

Phase: NA

Test Requiremnts: NA

CANCELLED

REV.	DATE	REASON	Contractor Approval	KSC Approval
B	9/6/74	Cancel	9-9-74 S Steven Dodge	9-9-74 L C Blanchard

7. APPROVAL	8. ORGANIZATION	9. DATE
s/Steven H. Dodge	LV-INS-12	
10. NASA-KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
s/L. C. Blanchard	LV-INS-12	1-19-72

KSC FORM 23-336B (7/67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
Telemetry Checkout Equipment
Readiness Test

2. KSC TEST NUMBER
V-28009

3. EFFECTIVITY
GSE

13. LOCATION
LCC

14. COMPUTER PROC. INDENTIFICATION
N/A

15. EST. TEST TIME

16. SUPPORT REQUIREMENTS

LCC Telemetry Checkout Equipment (TCE)
LCC TCE Magnetic Tape Recording

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

18. ITEM CONTINUATION

CANCELLED

KSC FORM 23-336C (7/67)

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PAGE II

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE: S-IC TELEMETRY SYSTEM SPARES CHECKOUT

2. KSC TEST NUMBER: V-28011

3. EFFECTIVITY: As required REV D,

4. TEST OBJECTIVES

To verify proper performance and operational readiness of the S-IC Telemetry System spares.

5. TEST DESCRIPTION EQUIPMENT STATUS/CONFIGURATION

THIS TEST [ ] DOES [XX] DOES NOT *CONTAIN HAZARDOUS OPERATIONS.* It is classed a standby.

Prime test organization is S-IC Stage

The following S-IC telemetry subsystems shall be tested individually to verify that all components are functioning properly and all subsystem parameters are within specified limits.

P1 Model 270 MUX, RDSM, Model 301 PCM/DDAS Assy, and PCM/RF Assy
F1 PAM/FM T/M Assy. and RF Assy.
A/B TM Calibrator and DC Isolator
COAXIAL SWITCH
MULTICOUPLER
RF TERMINATION
POWER DIVIDER

Test Requirements
MSFC: NA

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
D	1-9-70	ADDITION OF SPARE ITEMS FOR TEST		s/L.C. Blanchard
C	5/23/9	Changed effectivity from 503 & Subs to As Required. Removed items not applicable to 506 & On.		5-23-69 s/L.C. Blanchard
B	1/14/9	Deleted the following portions of the test because they are not required after AS-505: S1 Model 245 MUX. SS/FM TM and Top Deck Assy, & RF Assy; S2 Model 245 MUX, SS/FM TM and Top Deck Assy, & RF Assy; F2 PAM/FM T/M Assy and RF Assy; F3 PAM/FM TM Assy and RF Assy; A/B Tape Recorder	s/Jack Smith D.M.Vevera	s/L.C. Blanchard
A	1/11/68	Revise effectivity	s/W.E.Estes/ J.S.Clements	s/LCB

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
s/H.L.Burton/J.S.Clements	BATC 5-8521/5-8531	11/7/67
10. NASA-KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
s/L. C. Blanchard	LV-INS-12	11/7/67

KSC FORM 23-338 (7/67)

PAGE III

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE: S-IC TELEMETRY SYSTEM SPARES CHECKOUT

2. KSC TEST NUMBER: V-28011

3. EFFECTIVITY: As Required

13. LOCATION: LCC

14. COMPUTER PROC. INDENTIFICATION: NA

15. EST. TEST TIME: 24 Hrs.

16. SUPPORT REQUIREMENTS

Timing
LCC Telemetry Checkout Equipment
LCC TCE Recording
RF Clearance

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE: C-BAND TRANSPONDER BENCH TEST (STANDBY)

2. KSC TEST NUMBER: V-28054

3. EFFECTIVITY: AS REQUIRED

4. TEST OBJECTIVES

A. CONFIRM FLIGHT READINESS OF FLIGHT C-BAND TRANSPONDER.

B. CONFIRM FLIGHT READINESS OF SPARE C-BAND TRANSPONDER.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST __ DOES XX DOES NOT CONTAIN HAZARDOUS OPERATIONS.

DESCRIPTION: AFTER POWER IS APPLIED AND THE PROPER WARMUP TIME OBSERVED, SIGNALS WILL BE SENT BETWEEN THE C-BAND TRANSPONDER AND THE C-BAND TEST SET IN THE RF LAB. POWER OUTPUT WILL BE MEASURED BY THE USE OF A POWER METER. RECEIVER SENSITIVITY WILL BE MEASURED BY DECREASING THE SIGNAL LEVEL INPUT TO THE TRANSPONDER TO THE POINT OF COUNTDOWN. RECEIVER AND TRANSMITTER CENTER FREQUENCIES AND RECEIVER BANDWIDTH WILL BE MEASURED WITH THE USE OF A FREQUENCY COUNTER. RECOVERY TIME WILL BE MEASURED BY INTRODUCING A SECOND PAIR OF INTERROGRATION PULSES AND MEASURING HOW CLOSE THE TWO GROUPS OF PULSES CAN BE AND THE TRANSPONDER STILL REPLY TO BOTH GROUPS. PULSE SHAPE, DELAY TIME AND PULSE CODE SPACING WILL BE MEASURED BY OBSERVING THE DETECTED PULSE OUTPUTS ON AN OSCILLOSCOPE. ALL TELEMETRY OUTPUTS WILL BE MEASURED BY INTRODUCING DIFFERENT PRF'S AND INPUT SIGNAL LEVELS. THE INHIBIT CIRCUITRY WILL BE CHECKED BY INSURING THAT THERE ARE NO REPLIES WHILE THE TRANSPONDER IS INHIBITED. ANY RANDOM TRIGGERING WILL BE OBSERVED.

(CONT. BLOCK 5)

TEST REQUIREMENTS
MSFC: 7921601
0.3.2.4.2.1 THRU 0.3.2.4.2.3.1.4
0.3.2.4.2.5

STAGES: N/A

REV	DATE	REASON	Contractor Approval	KSC Approval
D	9-6-67	REVISED MSFC REQUIREMENTS		9-11-67
C	5-23-67	REVISE MSFC REQUIREMENTS		
B	5-3-67	CHANGE EFFECTIVITY TO STANDBY	S/R. GOULD	S/ J.BIZZEL
A	2-24-67	CHANGE EFFECTIVITY TO STANDBY		

6. CONTRACTOR APPROVAL: S/R. GOULD
7. ORGANIZATION: IBM 967
9. DATE: 25 SEPTEMBER 1967

11. NASA APPROVAL: S/ J.S. BIZZELL
12. ORGANIZATION: LV-INS-11
12. APPROVAL DATE: 10/17/67

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE: C-BAND TRANSPONDER BENCH TEST (STANDBY)

2. KSC TEST NUMBER: V-28054

3. EFFECTIVITY: AS REQUIRED

13. LOCATION: VAB, 26E7/26B7

14. COMPUTER PROG. IDENTIFICATION: N/A

15. EST. TEST TIME: 1 MAN - 4 HOURS

16. SUPPORT REQUIREMENTS

RD 41460

INTERSTAGE: N/A

OFF-COMPLEX: FREQUENCY CLEARANCE FOR 5690 & 5765 MHZ.

ON-COMPLEX: QAI

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

C-BAND RADAR TRANSPONDER SET SST-135C, (66-966-0020)

18. ITEM CONTINUATION

BLOCK 5 CONT.

TEST EQUIPMENT:
C-BAND BREAKOUT BOX, 67-967-001
C-BAND RF CHECKOUT STATION #1 ROOM 26E7:
P/N 63E900373G1, S/N 1
P/N 63E900374G1, S/N 1
P/N 63E900375G1, S/N 1

C-BAND RF CHECKOUT STATION #2, ROOM 26B7.
(ALTERNATE)
P/N 63E900376G1, S/N 1
P/N 63E900377G1, S/N 1
P/N 63E900378G1, S/N 1

CONFIGURATION: TEST TO BE PERFORMED IN EITHER ROOM 26B7 OR 26E7 TEST PROCEDURE V-28053 MUST BE COMPLETE PRIOR TO START OF THIS TEST; C-BAND TRANSPONDER WILL BE ATTACHED TO HEAT SINK DURING OPERATION.

REV 32

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
IU RADAR CLOSED LOOP TEST

2. KSC TEST NUMBER
V-28055

3. EFFECTIVITY 206 & SUBS
503 & SUBS

4. TEST OBJECTIVES

TO VERIFY COMPATIBILITY OF THE RADAR TRANSPONDER WITH THE AIRBORNE IU SYSTEMS AND ESTABLISH FLIGHT READINESS OF THE RADAR AIRBORNE SYSTEM.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

TEST EQUIPMENT: LAUNCH COMPLEX 39 RF TRANSMISSION LINKS, DRAWING NO. 203-434.

RF CHECKOUT STATION #1, RM. 26E7, COMPOSED OF:

P/N 63E900373G1, S/N 1
P/N 63E900374G1, S/N 1
P/N 63E900375G1, S/N 1

RF CHECKOUT STATION #2, RM. 26B7, COMPOSED OF THE FOLLOWING:

P/N 63E900376G1, S/N 1
P/N 63E900377G1, S/N 1
P/N 63E900378G1, S/N 1

DESCRIPTION:

AFTER POWER IS APPLIED AND THE PROPER WARMUP TIME OBSERVED, SIGNALS WILL BE SENT BETWEEN THE RADAR TRANSPONDER IN THE IU AND THE RADAR TEST SET IN THE RF LAB. POWER OUTPUT WILL BE MEASURED BY THE USE OF AN RF POWER METER. RECEIVER SENSITIVITY WILL BE MEASURED BY DECREASING THE SIGNAL LEVEL INPUT TO THE TRANSPONDER UNTIL COUNTDOWN OCCURS. RECEIVER AND TRANSMITTER CENTER FREQUENCIES AND RECEIVER BANDWIDTH WILL BE MEASURED WITH THE USE OF A FREQUENCY COUNTER. RECOVERY TIME WILL BE MEASURED BY INTRODUCING A SECOND PAIR OF INTERROGATION PULSES AND MEASURING HOW CLOSE THE TWO GROUPS OF PULSES CAN BE AND THE TRANSPONDER STILL REPLY TO BOTH GROUPS. PULSE SHAPES, DELAY TIME AND PULSE CODE SPACING WILL BE MEASURED BY OBSERVING THE DETECTED PULSE OUTPUTS ON AN OSCILLOSCOPE. ALL TELEMETRY OUTPUTS FROM THE RADAR TRANSPONDER WILL BE CHECKED AND CALIBRATED. THE INHIBIT CIRCUIT WILL BE TESTED BY ATTEMPTING TO INTERROGATE THE TRANSPONDERS AND MONITORING FOR REPLYS WITH THE INHIBIT APPLIED. ANY RANDOM TRIGGERING WILL BE OBSERVED AND RECORDED.

CONFIGURATION:

IU LOCATED IN VAB IN ERECTED POSITION; IU COOLING AND POWER ON; RF CLEARANCE FOR CLOSED LOOP OPERATION. 5690 & 5765 MHZ; ANTENNA COUPLER AND TRANSMISSION SYSTEM CONNECTED TO IU RADAR ANTENNA: TEST PROCEDURES V-28053 AND V-28059 (S-V) OR V-28227 AND V-28228 (SL-2) MUST BE COMPLETE PRIOR TO START OF THIS TEST. (CONT-18)

SEE BLOCK 18 FOR REVISION HISTORY

6. REV.	DATE	REASON	Contractor Approval	KSC Approval

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
S/ R. H. GOULD	IBM - 967	19 SEPTEMBER 1967
10. NASA APPROVAL S/ J. S. BIZZELL	11. ORGANIZATION LV-INS-11	12. APPROVAL DATE 26 SEPTEMBER 1967

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
IU RADAR CLOSED LOOP TEST

2. KSC TEST NUMBER
V-28055

3. EFFECTIVITY 206 & SUBS
503 & SUBS

13. LOCATION
VAB 26E7/26B7

14. COMPUTER PROG. INDENTIFICATION
N/A

15. EST. TEST TIME
1 MAN - 4 HOURS

16. SUPPORT REQUIREMENTS

RD 41460

INTERSTAGE: N/A

OFF-COMPLEX: FREQUENCY CLEARANCE FOR 5690 & 5765 MHZ

ON-COMPLEX: GROUND POWER, IU POWER, FACILITY COMMUNICATIONS (OIS), DDAS, RCA 110A, IBM MEASURING, QUALITY INSPECTOR

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

IBM DOCUMENT #66-966-008, C-BAND RADAR TRANSPONDER SET SST-135C

18. ITEM CONTINUATION

PHASE: III

TEST REQUIREMENTS

MSFC: 7921601

0.3.2.4.2.3.1.4	0.3.2.4.2.2.1.3
0.3.2.4.2.5	0.3.2.4.2.2.1.4
0.3.2.4.2.1.1.1	0.3.2.4.2.2.1.5
0.3.2.4.2.1.1.2	0.3.2.4.2.2.1.6
0.3.2.4.2.1.1.3	0.3.2.4.2.3.1.1
0.3.2.4.2.1.1.4	0.3.2.4.2.3.1.2
0.3.2.4.2.2.1.1	0.3.2.4.2.3.1.3
0.3.2.4.2.2.1.2	

REVISION HISTORY

REV.	DATE	REASON	CONTR. APPV'L	KSC APP'L
A	5/23/9	REVISE MSFC REQ'MTS	S/R. GOULD	S/J. BIZZELL
B	1/12/70	REVISE BLOCK 16	S/R. GOULD	S/J. BIZZELL
C	11/23/0	REVISE MSFC REQ'MTS	S/J. WASHBURN	S/J. BIZZELL
D	5/9/72	UPDATE FOR SL-2 EFFECTIVITY		
E	9/6/74	REVISED MSFC REQUIREMENTS		

REV. DATE REASON CONTR. APPV'L KSC APP'L

REV 32

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 3

1. TEST TITLE
IU RADAR OPEN LOOP TEST

2. KSC TEST NUMBER
V-28056

3. EFFECTIVITY
206 & SUB
512 & 514

4 TEST OBJECTIVES

1. VERIFY COMPATIBILITY OF THE AIRBORNE RADAR SYSTEM WITH THE EASTERN TEST RANGE RADAR INTERROGATION SYSTEMS.

2. VERIFY THE ABILITY OF THE GSE IN THE VAL TO INTERROGATE AND MONITOR THE IU RADAR.

5 TEST DESCRIPTION EQUIPMENT STATUS/CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT CONTAIN HAZARDOUS OPERATIONS.

TEST EQUIPMENT

1. LAUNCH COMPLEX 39 RF TRANSMISSION LINKS, DWG. NO. 203-434.

2. RF CHECKOUT STATION NO. 1, RM. 26E7, COMPOSED OF THE FOLLOWING: P/N 63C511294.

3. RF CHECKOUT STATION NO. 2, RM. 26B7, COMPOSED OF THE FOLLOWING, MAY BE USED AS AN ALTERNATE: P/N 63C511294.

DESCRIPTION

1. THE TRANSPONDER IS CONNECTED IN THE OPEN LOOP CONFIGURATION. POWER IS APPLIED AND THE FOLLOWING PARAMETERS ARE MEASURED BY THE ETR RADARS:

RECEIVER & TRANSMITTER CENTER FREQ.		BEACON DELAY
PULSE WIDTH		PRF
BALANCE		SIGNAL STRENGTH
JITTER		COUNTDOWN
RECOVERY TIME	INHIBIT	PULSE SPACING (CODING)

2. THE TRANSPONDER WILL BE OPERATED IN THE OPEN LOOP CONFIGURATION RADIATING THRU THE MSS PASSIVE REPEATER SYSTEM. THE RADAR GSE LOCATED IN ROOM 26E7 OR 26B7 WILL BE USED TO INTERROGATE THE TRANSPONDERS AND VERIFY PROPER OPERATION.

THE FOLLOWING PARAMETERS WILL BE CHECKED: PULSE SPACING, RECEIVER AND TRANSMITTER CENTER FREQUENCY, PULSE CHARACTERISTICS, PULSE DELAY, BEACON RECEIVER SENSITIVITY AND TRANSMITTER POWER, AND INHIBIT.

PHASE: III, VB, VI

TEST REQUIREMENTS
SEE BLOCK 18

(CONTINUED IN BLOCK 18)

6 REV.	DATE	REASON	Contractor Approval	KSC Approval
		SEE CONTINUATION SHEET FOR REVISION HISTORY		

7 CONTRACTOR APPROVAL	8 ORGANIZATION	9 DATE
S/ R. H. GOULD	IBM - 967	OCTOBER 10, 1969
10 NASA-KSC APPROVAL	11 ORGANIZATION	12. APPROVAL DATE
S/ J. BIZZELL	LV-INS-11	OCTOBER 18, 1969

KSC FORM 28-338 (7-67)

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APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 3

1. TEST TITLE
IU RADAR OPEN LOOP TEST

2. KSC TEST NUMBER
V-28056

3. EFFECTIVITY
206 & SUB
512 & 514

13. LOCATION
VAB 26E7/26B7

14. COMPUTER PROC. INDENTIFICATION
N/A

15. EST. TEST TIME
2 MEN. - 4 HOURS

16. SUPPORT REQUIREMENTS

RD 41460

INTERSTAGE: N/A

OFF-COMPLEX: RANGE RADAR READOUT, FREQUENCY CLEARANCE FOR 5690 AND 5765 MHZ OPEN LOOP.

ON-COMPLEX: GROUND POWER, IU POWER, FACILITY OIS, DDAS, RCA 110A, IBM MEASURING AND IBM QUALITY INSPECTOR.

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

C-BAND RADAR TRANSPONDER SET SST-135C, IBM DOCUMENT NO. 66-966-0008

18. ITEM CONTINUATION

(CONTINUED FROM BLOCK 5)

CONFIGURATION

VEHICLE LOCATED ON MOBILE LAUNCHER AT PAD 39A OR 39B, WITH MSS IN PLACE; IU COOLING AND POWER ON; ANTENNA COUPLER AND MSS ANTENNA SYSTEM CONNECTED TO IU RADAR ANTENNA; TEST PROCEDURES V-28053, V-28059 AND V-28055 COMPLETE/V-28228, V-28055 AND V-28227 COMPLETE.

TEST REQUIREMENTS SAT 1B
MSFC: 7921601

0.3.2.4.2	0.3.2.4.2.3
0.3.2.4.2.1	0.3.2.4.2.3.1
0.3.2.4.2.1.1	0.3.2.4.2.3.1.1
0.3.2.4.2.1.1.1	0.3.2.4.2.3.1.3
0.3.2.4.2.1.1.2	0.3.2.4.2.3.1.4
0.3.2.4.2.1.1.3	0.3.2.4.2.4
0.3.2.4.2.1.1.4	0.3.2.4.2.4.1
0.3.2.4.2.2	0.3.2.4.2.5
0.3.2.4.2.2.1	0.3.2.4.2.3.1.2
0.3.2.4.2.2.1.1	
0.3.2.4.2.2.1.2	
0.3.2.4.2.2.1.3	
0.3.2.4.2.2.1.4	
0.3.2.4.2.2.1.5	
0.3.2.4.2.2.1.6	

APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET (CONTINUATION SHEET) — PAGE 3 OF 3

1. TEST TITLE: IU PADAP. OPEN LOOP TEST

2. KSC TEST NUMBER: V-28056

3. EFFECTIVITY: 206 & SUB 512 & 514

ITEM CONTINUATION

REVISION HISTORY

A	3/28/68	MODIFY BLOCK 5	S/R. GOULD	S/J. BIZZELL
B	5/23/69	REVISE MSFC REQUIREMENTS	S/R. GOULD	S/J. BIZZELL
C	11/4/69	REVISE BLKS. 5, 10, 18 & MSFC REQ'MTS	S/R. GOULD	S/J. BIZZELL
D	11/23/70	REVISE MSFC REQUIREMENTS	S/J. WASHBURN	S/J. BIZZELL
E	5/10/72	REVISE BLK. 5, MSFC REQ'MTS, CHG. EFF.	J. E. Washburn	6-10-72
F	10/5/72	REVISE EFFECTIVITY	J. E. Washburn	10-10-72
G	9/5/74	REVISED MSFC REQUIREMENTS		9-6-74

KSC FORM 23-338A (7-67)

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
IU RF SYSTEM SUPPORT

2. KSC TEST NUMBER
V-28069

3. EFFECTIVITY
503 & SUBS

4. TEST OBJECTIVES

ESTABLISH A PROCEDURE FOR VERIFYING AIRBORNE HARDWARE OPERATION WHEN REQUIRED TO SUPPORT OTHER LAUNCH VEHICLE TESTING.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT CONTAIN HAZARDOUS OPERATIONS.

TEST EQUIPMENT:

COMMAND COMMUNICATIONS SYSTEM TEST SET P/N 01-26719H02 S/N2 OR S/N5

C-BAND RF CHECKOUT STATION RACKS 10, 11, 12
RM 26E7.
P/N 63E900 373G1 S/N1
P/N 63E900 374G1 S/N1
P/N 63E900 375G1 S/N1

C-BAND RF CHECKOUT STATION RACKS 13. 14, 15.
P/N 63E900 376G1 S/N1
P/N 63E900 377G1 S/N1
P/N 63E900 378G1 S/N1

COMMAND SIMULATOR
P/N 511091G4 - S/N 012 OR S/N 014
LUANCH COMPLEX 39 RF TRANSMISSION LINKS
DRAWING #203-434.

DESCRIPTION:

A SET OF INSTRUCTIONS FOR GROUND SUPPORT EQUIP. SET-UP AND QUICK LOOK EVALUATION OF THE OPERATION OF CCS, & C-BAND AIRBORNE EQUIPMENT IS PROVIDED. C-BAND AIRBORNE EQUIPMENT IS TESTED EITHER BY THE GSE OR ETR OR COMBINATION OF BOTH AS REQUIRED BY THE INTEGRATED TCP. CCS AIRBORNE EQUIPMENT IS TESTED EITHER BY THE GSE OR USB STATION OR COMBINATION OF BOTH AS REQUIRED BY THE INTEGRATED TCP.

PHASE: III, IV, VA, VB, VI

(CONTINUED IN BLOCK 18)

REV.	DATE	REASON	Contractor Approval	KSC Approval
B	11/23/0	REVISE MSFC REQUIREMENTS		12-16-70
A	5/23/9	REVISE MSFC REQUIREMENTS		5-29-69

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
S/ W. A. SULLINS	IBM - 967	22 NOVEMBER 1967
10. NASA-KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
S/ J. BIZZELL	LV-INS-11	11-29-67

KSC FORM 21-338 (7/67)

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APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
IU RF SYSTEM SUPPORT

2. KSC TEST NUMBER
V-28069

3. EFFECTIVITY
503 & SUBS

13. LOCATION
SEE BLOCK 18

14. COMPUTER PROC. INDENTIFICATION
N/A

15. EST. TEST TIME

16. SUPPORT REQUIREMENTS

FAD 41460

INTERSTAGE REQUIREMENTS:

OFF-COMPLEX: RF CLEARANCE FOR 2101, 2282, 5690, 5765 MHZ ETO READOUT OF C-BAND BEACONS. USB READOUT OF CCS.

ON-COMPLEX: IU POWER AND COOLING, IBM QUALITY INSPECTOR. OIS, DDAS, IU TELEMETRY, IU MEASURING.

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

TECHNICAL MANUALS FOR: COMMAND DECODER, IBM 66-699-0019; CCS P.A., IBM 67-699-0002; CCS TRANSPONDER, 67-699-0003; C-BAND 66-966-0020.

18. ITEM CONTINUATION

(CONTINUED) BLOCK 5

DESCRIPTION: THE TEST MAY BE IN THE VAB OR AT PAD A OR B.

CONFIGURATION: COMMAND AND COMMUNICATIONS SYSTEM, C-BAND SYSTEM, BOTH GSE AND AIRBORNE CONNECTED AS REQUIRED TO SUPPORT INTEGRATED TEST.

TEST REQUIREMENTS

MSFC: 7916404 (504 & SUBS)
0.3.2.4.1
0.3.2.4.2.5

BLOCK 13

LOCATION: VAB, 26E7, 26B7, PAD A OR PAD B.

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REV 32

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
TM MOBILE LAUNCHER GSE READINESS TEST

2. KSC TEST NUMBER
V-28070

3. EFFECTIVITY

4. TEST OBJECTIVES

To verify readiness of the Mobile Launcher Telemetry, RF , and DDAS closed loop coaxial cables; and verify patching and proper operation of the attenuator and passive combiner.

5. TEST DESCRIPTION, EQUIPMENT STATUS/CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT CONTAIN HAZARDOUS OPERATIONS.

Mobile Launcher DDAS cables for each stage will be tested for continuity and attenuation, and tested by time domain reflectometer.

Closed loop TM/RF cables for each stage will be tested for continuity, attenuation, and VSWR, and also by time domain reflectometer.

The attenuator and passive combiner will be tested for insertion loss and proper operation.

DDAS cables between the Firing Room and the TCE and lines from the TCE to the Retransmission Room (2P12) will be tested by Time Domain Reflectometer.

An end-to-end calibration of the DDAS cable and associated line driver will be performed for each stage. Line driver calibration curves may be generated from this data.

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
C	8-5-74	Procedure revision for ASTP to incorporate changes in TDR Testing	9-4-74 Steven Dodge	

7. PREPARED BY	8. ORGANIZATION	9. DATE
s/Steven H. Dodge	LV-IMS-12	
10. NASA/KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
s/L. C. Blanchard	LV-IMS-12	4-10-72

KSC FORM 23-33AC (7-67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
TM MOBILE LAUNCHER GSE READINESS TEST

2. KSC TEST NUMBER
V-28070

3. EFFECTIVITY
GSE

13. LOCATION

14. COMPUTER PROG. INDENTIFICATION

15. EST. TEST TIME
80 manhours

16. SUPPORT REQUIREMENTS
Telemetry Checkout Equipment
ESE DDAS
Facility Power
400 KHZ Ground Power
Stage Contractor QC
Boeing Networks
OIS Communications

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
Telemetry Checkout Equipment
Mechanical Maintenance Test

2. KSC TEST NUMBER
V-28150

3. EFFECTIVITY
GSE

4. TEST OBJECTIVES
To provide preventive maintenance and cleaning of the Telemetry Checkout Equipment and associated auxillary equipment; provide for removal and reinstallation of the LCC roof antennas in accordance with the KSC Hurricen Plan.

5. TEST DESCRIPTION/EQUIPMENT STATUS/CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT CONTAIN HAZARDOUS OPERATIONS.

The following steps will be accomplished:

Clean all racks and filters to remove dust, dirt, or lint.

Remove equipment filters, clean, dry, and reinstall.

Lubricate all fans, blowers, and motors requiring periodic lubrication.

Visually check the physical condition of all equipment and connectors.

CANCELLED

6. REV	DATE	REASON	Contractor Approval	KSC Approval
C	9/6/74	Cancel	9-9-74 Steven Dodge	2-29-72 L Blanchard

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
s/Steven H. Dodge	LV-INS-12	
10. NASA-KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
s/L. C. Llanchard	LV-INS-12	2-29-72

KSC FORM 23.33B (7/67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
Telemetry-Checkout Equipment
Mechanical Maintenance Test

2. KSC TEST NUMBER
V-28150

3. EFFECTIVITY
GSE

13. LOCATION
LCC

14. COMPUTER PROC. INDENTIFICATION

15. EST. TEST TIME
40 manhours

16. SUPPORT REQUIREMENTS
LCC Telemetry Checkout Equipment

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

18. ITEM CONTINUATION

CANCELLED

KSC FORM 23.33C (7/67)

REV 32

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KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1 TEST TITLE
DDAS PREVENTATIVE MAINTENANCE

2 KSC TEST NUMBER
V-28152

3 EFFECTIVITY
GSE 39A,B,C

4 TEST OBJECTIVES
TO PROVIDE INSTRUCTIONS FOR PERFORMANCE OF PREVENTATIVE MAINTANANCE ON THE DDAS SYSTEM.

5 EXPLOSIVE OR HAZARDOUS EQUIPMENT STATUS CONFIGURATION
THIS TEST DOES X DOES NOT CONTAIN HAZARDOUS OPERATIONS.

6 TEST DESCRIPTION
THIS PROCEDURE CONTAINS INSTRUCTIONS FOR PERIODIC CLEANING, PHYSICAL INSPECTION, ELECTRICAL CHECKOUT, AND ADJUSTMENT NECESSARY TO INSURE RELIABLE OPERATION OF THE DDAS SYSTEM.

THE PROCEDURE IS DIVIDED INTO THREE SECTIONS, WHICH MAY BE CONDUCTED ON A PERIODIC OR ELAPSE TIME BASIS. AN APPENDIX SECTION IS FOR SPECIAL CLEANING AND MECHANICAL PIN PUSH CHECKS.

1. MONTHLY/400 HR.
2. QUARTERLY/1200 HR.
3. SEMI-ANNUALLY/2400 HR.

7 PHASE: N/A

TEST REQUIREMENTS

MSFC: NONE

REV	DATE	REASON	Contractor Approval	KSC Approval

9 ORIGINATOR (ENTER BLOCK 10)

10 APPROVED BLOCKS 9 & 15

9 ORIGINATOR	9 DATE
IBM 908	

11 APPROVAL	11 ORGANIZATION	12 APPROVAL DATE

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

1 TEST TITLE
DDAS PREVENTATIVE MAINTENANCE

13 LOCATION
LC-39

14 COMPLETION / TERMINATION

15 SUPPORT REQUIREMENTS

1. INTERSTAGE REQUIREMENTS: NONE
2. OFF COMPLEX SUPPORT: NONE
3. ON COMPLEX SUPPORT:
   A. GROUND POWER
   B. DDAS
   C. RCA 110-A
   D. CSD-CLEAN FILTERS
   E. IBM QAI

17 OTHER APPLICABLE REFERENCE DOCUMENTATION
V-28185-GSE THROUGH V-28002 - GSE INCLUSIVE
VENDORS MANUAL, VR3600 MAGNETIC TAPE RECORDER.

18 ITEM CONTINUATION

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KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
G124
TELEMETRY CHECKOUT EQUIPMENT
PRE_EMPHASIS TOLERANCE TEST

2. KSC TEST NUMBER
V-28182

3. EFFECTIVITY
GSE/506 & subs

4. TEST OBJECTIVES

1. To establish FM channel pre-emphasis meter tolerance.
2. To establish/verify TMI pre-emphasis curve.
3. To establish BPIF output voltage tolerances (RMS).
4. To establish pre-emphasis DC voltage tolerances.

5. TEST DESCRIPTION/EQUIPMENT STATUS/CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT CONTAIN HAZARDOUS OPERATIONS.

The RF Signal Generator is adjusted to the FM/FM RCVR frequency and fed to the RCVR input. The RCVR video output is fed to the discriminators. The five-point calibrator is used to deviate the RF Signal Generator at each IRIG frequency for Channels 5 thru 18. Each channel is deviated at the standard pre-emphasis level and at ± 15% of standard pre-emphasis level.

The FM channel pre-emphasis meter readings, BPIF output voltage (RMS) readings, and pre-emphasis DC voltage reading for each channel at each deviation level are recorded for future reference. The TMI pre-emphasis curve is established or verified to be correct.

This test will be performed as required prior to checking or troubleshooting the S-II A/B FM/FM telemeter system.

FM/FM TCE in System Configuration.

Test Requirements

MSFC: Not Applicable

6. REV.	DATE	REASON	Contractor Approval	KSC Approval

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
K. M. Rist 1-16-69	North American Rockwell	1-17-69
10. NASA-KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
SD L. C. Blanchard	LV-INS-12	1-17-69

KSC FORM 23-338B (7/67)

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APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
G124
TELEMETRY CHECKOUT EQUIPMENT
PRE-EMPHASIS TOLERANCE TEST

2. KSC TEST NUMBER
V-28182

3. EFFECTIVITY
GSE 506 & Subs

13. LOCATION
TCE,LCC,2P10A

14. COMPUTER PROC. INDENTIFICATION
N/A

15. EST. TEST TIME
1.5 Hours

16. SUPPORT REQUIREMENTS

LCC TM Sta. (Monitor)

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

18. ITEM CONTINUATION

KSC FORM 23-338C (7/67)

REV 32

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
Telemetry Checkout Equipment Data Reduction Procedure

2. KSC TEST NUMBER
V-28184

3. EFFECTIVITY
GSE

4. TEST OBJECTIVES

To verify that the Telemetry Checkout Equipment is in the correct configuration for data reduction from magnetic tapes.

5. TEST DESCRIPTION EQUIPMENT STATUS/CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT CONTAIN HAZARDOUS OPERATIONS.

Prime test organization is Ground Instrumentation.

This procedure will use Stage Module and Common Module equipment. Required portions will be conducted prior to each playback. The portion or portions of this procedure to be used will depend upon the type of data reduction being performed. This procedure will describe the following:

1. Equipment setup for FM data reduction
2. Equipment setup for PCM data reduction
3. PCM-CIF Tape Playback
4. PCM-Digital Bit Stripout
5. Equipment setup for special PCM data reduction.
6. Equipment setup for SSB data reduction.
7. PCM patching configurations
8. Tape Dubbing.
9. Timing & Voice verification
10. Data annotation and disposition.
11. DLAS serial train recording.
12. Calibrations; Pen Recorder and Oscillograph
13. TCE Data coordination sheets
14. Data Switch Patching

CANCELLED

TEST REQUIREMENTS: N/A

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
B	9/6/74	Cancel	9-9-74 Steven Dodge	

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
s/A. Smith/L. Gantt	5-8511/5-8542	
10. NASA KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
s/L. C. Planchard	LV-INS-12	7-3-69

KSC FORM 23-338B (7/67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
TELEMETRY CHECKOUT EQUIPMENT DATA REDUCTION PROCEDURE

2. KSC TEST NUMBER
V-28184

3. EFFECTIVITY
GSE

13. LOCATION	14. COMPUTER PROC. INDENTIFICATION	15. EST. TEST TIME
LCC	N/A	

16. SUPPORT REQUIREMENTS

LCC Telemetry Checkout Equipment (TCE)
LCC TCE Magnetic Tape Recording.

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

V-28009 Telemetry Checkout Equipment Daily Readiness Test

18. ITEM CONTINUATION

CANCELLED

KSC FORM 23-338C (7/67)

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

TEST TITLE
SATURN IB ANTENNA SYSTEM AND RF CABLE CHECKOUT

V 28202

206 and Subs

TEST OBJECTIVES
MEASURE OPERATING PARAMETERS OF SIB ANTENNA SYSTEMS AND RF CABLES. THE OPERATING PARAMETERS MEASURED ARE:

ANTENNA VSWR
ANTENNA FEED SYSTEM ATTENUATION (POWER DIVIDER, DIRECTIONAL COUPLER AND RF CABLES)
ANTENNA SYSTEM VISUAL CHECK

TEST DESCRIPTION, EQUIPMENT STATUS, CONFIGURATION

THIS TEST DOES X DOES NOT CONTAIN HAZARDOUS OPERATIONS.

1. Antenna VSWR is measured by applying a signal at the operating frequency and modulated by 1 KHZ. A circular slotted line and VSWR indicator are used to obtain VSWR measurements. The operational frequency is verified with a Digital Frequency Counter.

2. The attenuation of the RF cables, power divider and directional coupler is measured by applying a C.W. signal at the operating frequency. Calibrated power meters are used to measure power loss. The operating frequency is verified with a Digital Frequency Meter.

3. The Antenna Subsystem (4 ea) are visually checked for physical damage. The vehicle shall be erected and the area around the antennas cleared of non-essential personnel.

TEST REQUIREMENTS
MSFC.
1) 3.7.2.1.1
2) 3.7.2.1.2
3) 3.7.2.1.3
4) 3.7.2.1.4
5) 3.7.2.2
6) 3.7.1.3

REV	DATE	REASON	CONTRACTOR APPROVAL	KSC ACTIVITY
A	6-9-72	Add Test Requirement 3.7.1.3 Visual Check of Antenna Subsystem		

NASA/KSC APPROVAL	ORIGINATOR	DATE
	CCSD	11/23/71
NASA/KSC APPROVAL	ORGANIZATION	APPROVAL DATE
	LV-INS-11	11-30-71

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

TEST TITLE
SATURN IB ANTENNA SYSTEM AND RF CABLE CHECKOUT

KSC TEST JOB #
V 28202

CONFIGURATION
206 and Subs

LOCATION
LC-39

COMPUTER PROG. IDENTIFICATION
N/A

EST TEST TIME
16 Hours

SPECIAL REQUIREMENTS

1. RANGE FREQUENCY CLEARANCE IS REQUIRED FOR 450 MHZ.
2. CCSD QC
3. C3TC

APPLICABLE REFERENCE DOCUMENTATION

1. "Test and Checkout Specifications and Criteria at KSC."
2. Saturn Antenna Manual

ITEM CONTINUATION

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

SIB DIGITAL RANGE SAFETY COMMAND (DRSC)
DECODER BENCH TEST (SPARE)

V-28203
206 & Subs LC-39

TO VERIFY THE OPERATIONAL STATUS OF THE SPARE
DRSC DECODER

THIS TEST DOES X DOES NOT CONTAIN HAZARDOUS OPERATIONS

The decoder is connected to the DRSC GSE and power is applied to the decoder. The following parameters are checked: power consumption, functional performance and sensitivity. The decoder logic circuits are verified by sending the Safe Command from the DRSC GSE and observing the Safe indications on the GSE indicator panel. This is performed with three (3) test codes to verify operation of all twenty-one gates, audio input sensitivity, high voltage and low voltage tests. Negative spikes on the output pulse are verified to be not greater than 3.0 volts amplitude.

TEST REQUIREMENTS
MSFC: 3.0.0.1.2.10.1.1
3.0.0.1.2.10.1.2
3.0.0.1.2.10.2
3.0.0.1.2.10.3
3.0.0.1.2.10.4
3.0.0.1.2.10.5
3.0.0.1.2.10.5.1
3.0.0.1.2.10.5.2
3.7.2.22

N A

DATE	REASON	Contractor Approval	KSC Approval
B 6-5-74	To reflect ET-66041 to 60C06050		
5-10-73	To Reflect FT-66009R2 to 60C06050		

7 ORIGINATOR APPROVAL	8 ORGANIZATION	9 DATE
	CCSD	11/23/71
10 QUALITY APPROVAL	11 ORGANIZATION	12 APPROVAL DATE
	LV-INS-11	11-29-71

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1 TEST TITLE
SIB DIGITAL RANGE SAFETY COMMAND (DRSC)
DECODER BENCH TEST (SPARE)

2 ASC TEST NO. ORDER
V-28203

3 VEHICLE
206 & Subs LC-39

4 LOCATION
LC-39

5 COMPUTER PROG. IDENTIFICATION
N/A

6 EST. TEST TIME
8 Hours

7 SUPPORT REQUIREMENTS

DRSC GSE (LCC ROOM 2P10)
CCSD QC

8 OTHER APPLICABLE REFERENCE DOCUMENTATION
1. Test Specifications & Criteria at KSC
2. AVCO Instruction Manual - Decoder

9 ITEM CONTINUATION

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1 TEST TITLE
DIGITAL RANGE SAFETY COMMAND (DRSC)
CEIVER BENCH TEST (SPARE)

2 TEST NUMBER
V-28204

3 EFFECTIVITY
206 & Subs LC-39

4 NOTES

TO VERIFY THE OPERATIONAL STATUS OF THE SPARE DRSC RECEIVER.

5 TEST EQUIPMENT STATUS CONFIGURATION

DOES X DOES NOT CONTAIN HAZARDOUS OPERATIONS.

The receiver is connected to the DRSC GSE and power is applied. The following parameters are checked: 3 DB bandwidth, 60 DB bandwidth, center frequency, limiter monitor voltage, quieting, audio frequency response, and image frequency rejection, power input, audio ouput, audio bandwidth and deviation sensitivity.

Vehicle Configuration - N/A

TEST REQUIREMENTS

KSC	3.0.0.1.2.9.1
	3.0.0.1.2.9.2
	3.0.0.1.2.9.3
	3.0.0.1.2.9.4
	3.0.0.1.2.9.5
	3.0.0.1.2.9.6
	3.0.0.1.2.9.7
	3.0.0.1.2.9.8
	3.0.0.1.2.9.9
	3.0.0.1.2.9.10

N/A

REV	DATE	REASON	Contractor Approval	KSC Approval
A	5-10-73	To Reflect ET-66009R2 to 60C06050		

7 PREPARED BY APPROVAL	8 ORGANIZATION	9 DATE
	CCSD	
10 NASA/KSC APPROVAL	11 ORGANIZATION	12 APPROVAL DATE
	LV-INS-11	12-3-77

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1 TEST TITLE
SIB DIGITAL RANGE SAFETY COMMAND (DRSC)
ECEIVER BENCH TEST (SPARE)

2 TEST NUMBER
V-28204

3 EFFECTIVITY
206 & Subs LC-39

13 LOCATION
LC-39

14 COMPUTER PROG IDENTIFICATION
N/A

15 EST. TEST TIME
8 Hours

16 SUPPORT REQUIREMENTS

Range Clearance - 450 MHZ

DRSC GSE (LCC Room 2P10)

CCSD QC

17 OTHER APPLICABLE REFERENCE DOCUMENTATION

1. Test specifications & criteria at KSC
2. Motorola Instruction Manual - Receiver Mod MCR 503

18 ITEM CONTINUATION

195

REV 32

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

DIGITAL RANGE SAFETY COMMAND (DRSC)
SYSTEMS TEST - CLOSED LOOP (VAB)

V-28205

206 & Subs LC-39

To insure Flight Readiness of the Digital Range Safety Command System. System parameters verified are:

Receiver Bandwidth	System Command Verification
Image Rejection	System RF Threshold Level
Receiver Quieting	System Deviation Threshold Level
Decoder Logic Verification	Receiver Limiter Monitor Voltage

THIS TEST DOES X DOES NOT CONTAIN HAZARDOUS OPERATIONS.

All Vehicle command antennas and closed loop cables are connected to the receivers.

Calibrated closed loop cables are connected between the vehicle DRSC system and the DRSC GSE in the LCC, Room 2P10. An unmodulated RF signal is transmitted from the DRSC GSE to the Vehicle DRSC receivers to ascertain the following operating parameters:

Receiver 3 DB Bandwidth, 60 DB Bandwidth, corrected center frequency, quieting, limiter monitor voltage and image frequency rejection. An RF signal is then frequency modulated with various audio signals and the frequency response of the receiver is obtained. System dynamic bandwidth is checked.

The Vehicle DRSC Systems are exercised by modulating the RF signal with various commands. Saturn IB VMGSE recordings of the DRSC measurements are analyzed to determine the functional performance of the systems.

Decoder logic circuits are verified by modulating the carrier with cutoff commands from the GSE encoder, and verifying output at TCE. This is performed with 3 test codes to verify all 21 gates. Negative spikes on the output pulse are verified to be not greater than 3.0 volts amplitude.

Vehicle Erected - Umbilicals Connected.

TEST REQUIREMENTS
(See Item 18, Page 2)

REV	DATE	REASON	Contractor Approval	KSC Approval
A	8-5-74	To reflect ET-66041 to 60C06050	11/24	4-30-76

CONTRACTOR APPROVAL	8 ORGANIZATION	9 DATE
	CCSD	11/30/71
NASA/KSC APPROVAL	11 ORGANIZATION	12 APPROVAL DATE
	LV-INS-11	12-3-71

APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 2 OF 2

DIGITAL RANGE SAFETY COMMAND (DRSC)
SYSTEMS TEST - CLOSED LOOP (VAB)

V-28205

206 & Subs LC-39

LOCATION	4 SIMULTANEOUS ACTIVITY	5 EST TEST TIME
LC-39	N/A	16 Hours

6 SUPPORT REQUIREMENTS

1. SIB Stage Power
2. DDAS
3. SIB Vehicle Measuring GSE
4. DRSC GSE (LCC, Room 2P10)
5. Range Frequency Clearance for 450, 241, and 471 MHZ.
6. LCC TCE (LCC, Room 2P10)
7. CCSD QC
8. C3TC

17 OTHER APPLICABLE REFERENCE DOCUMENTATION

1. Test & Checkout Specifications & Criteria at KSC
2. AVCO Instruction Manual - Decoder
3. Motorola Instruction Manual - Rec. Model MCR 503

18 ITEM CONTINUATION

ITEM 5(Continued)

TEST REQUIREMENTS - MSFC

1. 3.7.2.4
2. 3.7.2.5
3. 3.7.2.6
4. 3.7.2.8.1
5. 3.7.2.8.2
6. 3.7.2.9.1
7. 3.7.2.9.2
8. 3.7.2.10
9. 3.7.2.11
10. 3.7.2.17.1
11. 3.7.2.17.2
12. 3.7.2.17.3
13. 3.7.2.17.4
14. 3.7.2.18
15. 3.7.2.19
16. 3.7.2.22

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
TELEMETRY, FM/FM SYSTEM FUNCTIONAL TEST (SPARE)

2. KSC TEST NUMBER
V-28217

3. EFFECTIVITY
206 & Subs LC-39

4. TEST OBJECTIVE
The objective of this test is to verify the performance of the spare FM/FM telemeter system. This is accomplished by measuring the SCO deviation of the RF carrier, SCO center frequencies and bandedge frequencies, confirming that preflight/inflight calibrations are received, and by measuring RF assembly power output and transmitter center frequency. Proper calibration sequence of the TM calibrator is verified.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST ( ) DOES (X) DOES NOT CONTAIN HAZARDOUS OPERATIONS.

The Telemeter System is connected to the TM checkout rack and the TCE stage module. The TCE RF signal generator is modulated at the SCO frequencies conforming to the FM/FM carrier deviation schedule and discriminator reference levels are recorded. Power is applied to the telemeter. Preflight calibration level of 50% is selected and the FM/FM carrier deviation schedule is compared to the recorded discriminator reference levels. Center frequencies of the SCO's are verified at the preflight calibration level of 50%. Preflight levels of 0% and 100% are selected, and the SCO's are checked for bandedge frequencies. The RF transmitter power output and center frequency are measured and verified to be within tolerable limits. The telemeter is checked for reception of preflight calibration and inflight calibration assignment.

FM/FM System (Spare) is verified in a Laboratory Test.

TEST REQUIREMENTS:
MSFC - N/A
KSC - N/A

REV.	DATE	REASON	Contractor Approval	KSC Approval

CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
	CCSD	12-6-71
NASA KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
	LV-INS-12	12-15-71

FORM 2 9 4 (7 67)

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APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
TELEMETRY, FM/FM SYSTEM FUNCTIONAL TEST (SPARE)

2. KSC TEST NUMBER
V-28217

3. EFFECTIVITY
206 & Subs LC-39

13. LOCATION	14. COMPUTER PROC. INDENTIFICATION	15. EST. TEST TIME
LC-39	N/A	4 Hours

16. SUPPORT REQUIREMENTS

1. Range frequency clearance (240.2 MHZ), closed loop
2. LCC Telemetry Checkout Equipment (Stage and Common module)

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

1. Instrumentation Program and Components List
2. Telemeter Checkout Rack Drawing, K-VE2-03037-1

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

2. TEST TITLE
TELEMETRY, PCM SYSTEM FUNCTIONAL TEST

3. TEST NUMBER
V-28218

4. EFFECTIVITY
206 & Subs LC-39

5. TEST DESCRIPTION The objective of this test is to verify acceptable performance of the PCM/FM System. Parameters measured during this test are:
1. 600 KHZ VCO-Power Output and VCO Deviation
2. Transmitter Center Frequency and Deviation
3. Bit Rate and Encoding Accuracy of PCM/DDAS Assembly
4. Multiplexer Inflight Calibration Levels and Sequence
5. Frame and Master Frame Time Slot and Bit Pattern
6. Multiplexer Programming Verification

7. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST DOES X DOES NOT CONTAIN HAZARDOUS OPERATIONS.

The VCO Power Output is determined by observing the VCO line driver input measurement on ESE. The voltage read is compared to a calibration curve for the ESE channel and VCO power is then determined. At the CIF/TCE (2P12) the GP1 Transmitter and VCO 600 KHZ center frequency and frequency deviation are obtained by zero beating each signal with a test oscillator frequency. A circular Lissajous pattern is obtained and the corresponding test oscillator frequency is read from a frequency counter.

The PCM bit rate is determined by monitoring the clock output. The Model 270 multiplexers are checked for reception of inflight and single point calibrations. Frames 9 & 10, Channel 28, of both multiplexers are observed for encoding accuracy of zero and five volts, respectively. Proper bit configuration and time slots for the frame and master frame sync words are verified by observing bit indications on the D/A Converter (Cal-Up) Panel.

Multiplexer inflight levels and sequence are verified by observing calibration levels of each representative multiplexer channel as displayed on CIF/TCE (291) Chart Recorder.

The S-IB Stage shall be in a vertical, mated configuration.

TEST REQUIREMENTS
MSFC: 3.2.2.1 thru 3.2.2.8.1; 3.2.3.1 or 3.2.3.2
KSC: N/A

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
B	7-16-74	To reflect new locations of TM Checkout Equipments		9-3-74 L. C. Blanchard
A	2-6-73	Revised Measuring method for VCO Frequency and Deviation	J. R. Howard	L. C. Blanchard

7. PREPARED BY	8. ORGANIZATION	9. DATE
J. R. Howard JDM KRA	CCSD	12-7-71
10. NASA-KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
L. C. Blanchard	LV-INS-12	12-15-71

PSC FORM 23-538 (7/67)

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

2. TEST TITLE
TELEMETRY, PCM SYSTEM FUNCTIONAL TEST

3. TEST NUMBER
V-28218

4. EFFECTIVITY
206 & Subs LC-39

13. LOCATION	14. COMPUTER PROG. IDENTIFICATION	15. EST. TEST TIME
VAB	N/A	6 Hours

16. SUPPORT REQUIREMENTS
1. Range Frequency Clearance is required (256.2 MHZ)
2. S-IB Stage Power
3. CIF/TCE (2P12 & 291)
4. N/A
5. RCA-110A Computer Complex
6. Access to Instrumentation Compartment #13

17. OTHER APPLICABLE REFERENCE DOCUMENTATION
1. Instrumentation Program and Components List
2. S-IB Stage Cable Interconnection Diagram
3. S-IB Stage Electrical Schematics

18. ITEM CONTINUATION

REV 32

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REV 32

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

SHELF LIFE EXTENSION TEST FOR COMMAND DECODER 50M10699 (STANDBY)

2. KSC TEST NUMBER: V-28223

3. EFFECTIVITY: AS REQUIRED

4. TEST OBJECTIVES

THE OBJECTIVE OF THIS PROCEDURE IS TO VERIFY THAT THE DECODER MEETS THE REQUIRED SPECIFICATIONS FOR THE EXTENSION OF SHELF LIFE.

5. EFFECT ON EQUIPMENT STATUS CONFIGURATION

THIS TEST DOES X DOES NOT CONTAIN HAZARDOUS OPERATIONS.

6. TEST DESCRIPTION

THE DECODER WILL BE TESTED IN AN ENVIRONMENTAL CHAMBER TO MEET THE REQUIRED OPERATIONAL SPECIFICATIONS FOR THE EXTENSION OF SHELF LIFE. THE TESTS WILL BE CONDUCTED UNDER AMBIENT TEMPERATURE CONDITIONS AND AT THE RECOMMENDED MINIMUM/MAXIMUM OPERATING VOLTAGES. TESTS TO BE PERFORMED WILL INCLUDE THE FOLLOWING:

1. COMMAND LOGIC TEST
2. SENSITIVITY TEST
3. TM OUTPUT TEST
4. 2.2 VOLT BLOCKING TEST
5. QUIESCENT CURRENT TEST
6. TWO-TONE CURRENT TEST
7. NORMAL OPERATING CURRENT CONSUMPTION TEST
8. HARDWARE SENSITIVITY TEST
9. POWER SWITCH LEAKAGE TEST
10. FLEYPOINT TEST
11. Negative spikes on output pulse less than 3.0 volts amplitude.

7. GSE-TO-GSE CONFIGURATION: N/A

MSFC REQUIREMENTS:

3.0.0.2.1
3.0.0.2.1.2.1.
3.0.0.2.1.2.2
3.0.0.2.1.2.3
3.0.0.2.1.2.4
3.0.0.2.1.2.5
3.0.0.2.1.2.6
3.0.0.2.1.2.7
3.0.0.2.1.2.8
3.0.0.2.1.2.9
3.0.0.2.1.2.10

REV	DATE	REASON	Contractor Approval	KSC Approval
B	8-5-74	To reflect ET-66041 to 60C6050	M. Glenn 8/7/74	[illegible] 8-7-74
A	5 21 73	To reflect ET-66009R2 to 60C06050	M. Glenn per 140 5/14/73	[illegible] 5-21-73

8. CONTRACTOR APPROVAL: Martin Glenn
ORGANIZATION: CHRYSLER CORP., SPACE DIVISION
9. DATE: 12/16/71

10. NASA/KSC APPROVAL: [illegible]
11. ORGANIZATION: LV-INS-11
12. APPROVAL DATE: 12-21-71

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE: SHELF LIFE EXTENSION TEST FOR COMMAND DECODER 50M10699 (STANDBY)

KSC TEST NUMBER: V-28223
EFFECTIVITY: AS REQUIRED

13. LOCATION: LC-39
14. CONFIGURATION IDENTIFICATION: N/A
15. EST. TEST TIME: 12 HOURS

16. SUPPORT REQUIREMENTS

1. CCSD O.C.
2. DRSC GSE (LC-39 ROOM 2P10)

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

1. EXTENSION OF SHELF LIFE TESTING FOR SRS DECODER (50M16498)
2. AVCO INSTRUCTION MANUAL - DECODER AVCO MODEL 331800

18. ITEM CONTINUATION

199

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

TEST TITLE
SHELF LIFE EXTENSION TEST FOR COMMAND RECEIVER MCR-503
50M10697 (STANDBY)

KSC TEST NUMBER
V-28224

EFFECTIVITY
AS REQUIRED

TEST OBJECTIVES

THE OBJECTIVE OF THIS PROCEDURE IS TO VERIFY THAT THE COMMAND RECEIVER MEETS THE REQUIRED SPECIFICATIONS FOR THE EXTENSION OF SHELF LIFE.

TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST DOES X DOES NOT CONTAIN HAZARDOUS OPERATIONS.

THE RECEIVER WILL BE TESTED IN AN ENVIRONMENTAL CHAMBER TO MEET THE REQUIRED OPERATIONAL SPECIFICATIONS FOR THE EXTENSION OF SHELF LIFE. THE TESTS WILL BE CONDUCTED UNDER VARIOUS TEMPERATURE CONDITIONS AND AT THE RECOMMENDED MINIMUM/MAXIMUM OPERATING VOLTAGES. TESTS TO BE PERFORMED WILL INCLUDE THE FOLLOWING:

1. AUDIO OUTPUT TEST
2. AUDIO BANDWIDTH TEST
3. INPUT POWER TEST
4. RECEIVER QUIETING
5. LOW LEVEL TM TEST
6. OVERALL RF BANDWIDTH TEST
7. INPUT VOLTAGE TEST
8. IMAGE REJECTION TEST
9. ELECTRICAL RESISTANCE TESTS

VEHICLE CONFIGURATION - N/A

MSFC REQUIREMENTS:

3.0.0.2.1	3.0.0.2.1.1.8
3.0.0.2.1.1.1	3.0.0.2.1.1.9
3.0.0.2.1.1.2	3.0.0.2.1.1.10
3.0.0.2.1.1.3	3.0.0.2.1.1.11
3.0.0.2.1.1.4	
3.0.0.2.1.1.5	
3.0.0.2.1.1.6	
3.0.0.2.1.1.7	

N A

DATE	REASON	Contractor Approval	KSC Approval
3/21/73	To reflect FT-66009R2 to 60C06050		

PREPARED BY	ORGANIZATION	DATE
	CHRYSLER CORP, SPACE DIVISION	12-20-71

APPROVED BY	ORGANIZATION	APPROVAL DATE
	I-ENG-11	12-21-71

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

TEST TITLE
SHELF LIFE EXTENSION TEST FOR COMMAND RECEIVER MCR-503
50M10697 (STANDBY)

AS REQUIRED

LOCATION
LC-39

COMPUTER PROG. IDENTIFICATION
N/A

SUPPORT REQUIREMENTS

1. CCSD O.C.
2. RANGE FREQUENCY CLEARANCE FOR 450, 241, AND 471 MHz.
3. DRSC GSE (LCC-39, Room 2P10)

OTHER APPLICABLE REFERENCE DOCUMENTATION

1. EXTENSION OF SHELF LIFE TESTING FOR COMMAND RECEIVER MCR-503 (50M16389)
2. MOTOROLA INSTRUCTION MANUAL - RECEIVER MODEL MCR 503

ITEM CONTINUATION

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
IU COMMAND BENCH TEST (STANDBY)

2. KSC TEST NUMBER
V-28231

3. EFFECTIVITY
AS REQUIRED

200

4. TEST OBJECTIVES

TO VERIFY THE OPERATING PARAMETERS OF THE IU COMMAND SYSTEM ARE WITHIN TOLERANCE.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST DOES X DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

DESCRIPTION

SIGNALS ARE FED FROM THE LABORATORY GSE TO THE IU COMMAND SYSTEM ON THE BENCH. THE RF SIGNAL GENERATOR IS USED AS A 450 MHZ SOURCE. ITS OUTPUT IS FM MODULATED BY THE COMMAND SIMULATOR AND FED TO THE COMMAND RECEIVER. RECEIVER DEVIATION SENSITIVITY IS DETERMINED BY INCREASING THE DEVIATION OF THE TEST SIGNAL UNTIL THE RECEIVER OUTPUT IS 1.27 VRMS AND MEASURING THE DEVIATION AT THIS POINT. FOR BANDWIDTH MEASUREMENT, THE UNMODULATED SIGNAL GENERATOR OUTPUT LEVEL IS INCREASED 3DB, AND ITS FREQUENCY VARIED ABOVE, THEN BELOW 450 MHZ UNTIL THE TM LO OUTPUT DECREASES TO 2.0V. THE FREQUENCIES AT THESE TWO POINTS DETERMINE THE 3DB BANDWIDTH. THE AVERAGE OF THE TWO IS RECEIVER CENTER FREQUENCY. THE 60DB BANDWIDTH IS DETERMINED IN THE SAME MANNER AS THE 3DB BANDWIDTH. RECEIVER QUIETING IS DETERMINED BY MEASURING THE DIFFERENCE IN OUTPUT FOR NO INPUT AND FOR 10UV INPUT. SYSTEM SENSITIVITY, BANDWIDTH, CENTER FREQUENCY, AND DEVIATION SENSITIVITY ARE DETERMINED IN A MANNER SIMILAR TO THE RECEIVER PARAMETERS EXCEPT 100% AVP THRESHOLD IS THE LIMIT INDICATION. DECODING ACCURACY IS TESTED BY SUCCESSIVELY COMPLEMENTING EACH BIT OF A CORRECT MESSAGE AND OBSERVING PROPER DECODER OPERATION. SYSTEM PHASE SHIFT IS MEASURED BY VARYING THE PHASE BETWEEN THE 1 AND 2 KHZ TO THE POINT WHERE 100% AVP'S CAN JUST BE MAINTAINED; AND THEN MEASURING THE PHASE DIFFERENCE ON AN OSCILLOSCOPE. DATA DECODING ACCURACY, ADDRESS VERIFICATION AND COMPUTER RESET ARE DISPLAYED BY INDICATOR LIGHTS ON DECODER DISPLAY AND ARE INTERPRETED FOR PROPER OPERATION.

CONFIGURATION: N/A

PHASE: N/A

TEST REQUIREMENTS
MSFC: 7921601

0.3.2.4.4.1.1
THRU
0.3.2.4.4.1.10

6. REV.	DATE	REASON	Contractor Approval	KSC Approval

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
[signature]	IBM - 967	6-5-72
10. NASA KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
[signature]	[illegible]	6-19-72

KSC FORM 21-118 7-67

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
IU COMMAND BENCH TEST (STANDBY)

2. KSC TEST NUMBER
V-28231

3. EFFECTIVITY
AS REQUIRED

13. LOCATION	14. COMPUTER PROC. INDENTIFICATION	15. EST. TEST TIME
VAB 26E7	N/A	1 MAN - 4 HOURS

16. SUPPORT REQUIREMENTS

INTERSTAGE: NONE

OFF-COMPLEX: FREQUENCY CLEARANCE FOR 450 MHZ, CLOSED LOOP

ON-COMPLEX: FACILITY COMMUNICATIONS (OIS)
QUALITY INSPECTOR

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

MSFC #III-5-509-8; III-5-510-17; III-5-510-26

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE: IU RF SYSTEMS SUPPORT - VAB

2. KSC TEST NUMBER: V-28232

3. EFFECTIVITY: AS-206 & SUBS

4. TEST OBJECTIVES

TO VERIFY THAT THE RF SYSTEMS FUNCTION PROPERLY; AND TO SUPPORT OTHER LAUNCH VEHICLE TESTING.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST [ ] DOES [X] DOES NOT CONTAIN HAZARDOUS OPERATIONS.

DESCRIPTION:

A. COMMAND - SIGNALS ARE TRANSMITTED BY HARDLINE FROM THE RF GSE TO THE IU COMMAND SYSTEM ABOARD THE VEHICLE. THE RF SIGNAL GENERATOR IS THE 450 MHZ SIGNAL SOURCE. ITS OUTPUT, MODULATED BY THE ACS, IS FED TO THE COMMAND RCVR INPUT. USING DECODER AVP AS THE CRITERION SYSTEM BANDWIDTH, CENTER FREQUENCY, SENSITIVITY, DEVIATION SENSITIVITY AND MESSAGE DECODING ARE CHECKED TO ENSURE THE ONBOARD SYSTEM FUNCTIONS PROPERLY. THE GSE IS CONFIGURED TO SUPPORT THE INTEGRATED TEST IN PROGRESS.

B. RADAR - THE GSE IS PREPARED TO CHECKOUT THE ON BOARD SYSTEMS. SIGNALS WILL BE SENT BETWEEN THE GSE AND THE TRANSPONDER IN THE IU. POWER OUTPUT IS MEASURED VIA A RF POWER METER. RECEIVER SENSITIVITY IS MEASURED BY DECREASING THE SIGNAL LEVEL INTO THE TRANSPONDER UNTIL COUNTDOWN OCCURS. RECEIVER AND TRANSMITTER CENTER FREQUENCIES ARE MEASURED VIA A FREQUENCY COUNTER. PULSE SHAPES, DELAY TIME, AND PULSE CODE SPACING ARE MEASURED BY OBSERVING THE DETECTED PULSE OUTPUTS ON AN OSCILLOSCOPE. TELEMETRY OUTPUTS ARE MEASURED. THE INHIBIT CIRCUITS ARE TESTED BY ATTEMPTING TO INTERROGATE THE TRANSPONDERS AND MONITORING FOR REPLYS WITH THE INHIBIT APPLIED. THE INHIBIT IS REMOVED AND THE GSE CONTINUES TO INTERROGATE THE TRANSPONDER IN SUPPORT OF OTHER VEHICLE TESTING AS REQUIRED.

CONFIGURATION: IU LOCATED IN THE VAB IN ERECTED POSITION; IU COOLING AND POWER ON; ANTENNA COUPLERS AND TRANSMISSION SYSTEM CONNECTED TO IU RADAR ANTENNA.

PHASE: III, IV, VA

TEST REQUIREMENTS
MSFC: 7921601
0.3.2.4.2.5
0.3.2.4.4.1

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
A	8/27/74	REVISED MSFC REQUIREMENTS		9-11-74

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
John E. Washburn	IBM - 967	5-4-72
10. NASA KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
	LV-INS-11	6-14-72

FORM 22-336 (7/67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE: IU RF SYSTEMS SUPPORT - VAB

2. KSC TEST NUMBER: V-28232

3. EFFECTIVITY: AS-206 & SUBS

13. LOCATION: VAB 26E7, PAD B

14. COMPUTER PROG. INDENTIFICATION: FT45, FT47

15. EST. TEST TIME: 4 MEN - 4 HOURS

16. SUPPORT REQUIREMENTS

RD 41460

INTERSTAGE: NONE

OFF-COMPLEX: RF CLEARANCE FOR 450, 5690, 5765 MHZ; USB 450 MHZ XMTR FOR LV/MCC(SIT)

ON COMPLEX: IU POWER AND COOLING, IU MEASURING, DDAS, OIS, RCA 110A, LVDA/LVDC, QUALITY INSPECTOR

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

MSFC III-5-510-26, III-5-510-17, III-5-509-8, III-5-510-18; KSC PRINTS 79K01227, 77K09177

18. ITEM CONTINUATION

REV 32

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE: IU RF SYSTEMS SUPPORT - PAD

2. KSC TEST NUMBER: V-28233

3. EFFECTIVITY: AS-206 & SUBS

4. TEST OBJECTIVES

TO VERIFY THAT THE RF SYSTEMS FUNCTION PROPERLY; AND TO SUPPORT OTHER LAUNCH VEHICLE TESTING.

5. TEST DESCRIPTION/EQUIPMENT STATUS CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

DESCRIPTION:

INSTRUCTIONS FOR GSE SET-UP AND QUICK LOOK EVALUATION OF THE OPERATION OF IU COMMAND AND RADAR AIRBORNE EQUIPMENT IS PROVIDED. RADAR IS TESTED BY EITHER THE GSE OR ETR, OR BOTH AS REQUIRED BY THE INTEGRATED TCP. IU COMMAND IS TESTED BY THE GSE OR GMIL AS REQUIRED BY THE INTEGRATED TCP. PROVISION IS MADE FOR THE GSE TO CAPTURE THE COMMAND RECEIVER AND SEND UPDATA COMMANDS CLOSED LOOP, AS WELL AS OPEN LOOP.

CONFIGURATION: VEHICLE ON PAD B; BOTH GSE AND AIRBORNE SYSTEMS CONNECTED AS REQUIRED TO SUPPORTED INTEGRATED TEST.

PHASE: VB, VI

TEST REQUIREMENTS
MSFC: 7921601
0.3.2.4.2.4.1
0.3.2.4.2.5
0.3.2.4.4.1

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
A	8/27/74	REVISED MSFC REQUIREMENTS		9-11-74

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
D. E. Washburn	IBM-967	5-8-72
10. KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
	LV-INS-11	6-16-72

KSC FORM 25-238 (7/67)

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APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE: IU RF SYSTEMS SUPPORT - PAD

2. KSC TEST NUMBER: V-28233

3. EFFECTIVITY: AS-206 & SUBS

13. LOCATION: 26E7, LC 39B

14. COMPUTER PROG. INDENTIFICATION: FT45, FT47

15. EST. TEST TIME: 6 MEN - 4 HRS

16. SUPPORT REQUIREMENTS

RD 41460

INTERSTAGE REQUIREMENTS: NONE

OFF-COMPLEX: RF CLEARANCE FOR 450, 5690, 5765 MHZ; ETR READOUT OF IU RADAR; GMIL READOUT OF IU COMMAND.

ON-COMPLEX: IU POWER AND COOLING, IBM QA, OIS, DDAS, IU TELEMETRY, IU MEASURING, 23D111 BUS POWER IN LUT

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

IBM TECHNICAL MANUALS 66-699-0019; 67-966-0014; 66-966-0020

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1 TEST TITLE

RF ANTENNA ORIENTATION AND MSS CABLE CHECKS

2. KSC TEST NUMBER
V-28234

3. EFFECTIVITY
AS-206 & SUBS

4 TEST OBJECTIVES

PHYSICALLY ORIENT MSS REPEATER ANTENNAS FOR OPTIMUM OPERATION WITH ETR GROUND STATIONS, AND VAB ROOF ANTENNAS; ORIENT VAB ROOF ANTENNAS TO MSS; TO MEASURE DELAY AND ATTENUATION OF MSS REPEATER ANTENNA SYSTEM; TO MEASURE ATTENUATION FROM THE LUT GSE TO THE INPUT OF THE COMMAND RECEIVER.

5 TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

DESCRIPTION:

A. FOR ATTENUATION MEASUREMENTS, A SIGNAL OF KNOWN VALUE IS INJECTED INTO TRANSMISSION SYSTEM UNDER TEST AND SIGNAL LEVEL ARRIVING AT OPPOSITE END IS MEASURED. THE DIFFERENCE IS RECORDED AS SYSTEM LOSS.

B. FOR RADAR DELAY, A RADAR TRANSPONDER IS OPERATED AT THE POINT WHERE DELAY MEASUREMENT IS REQUIRED AND RADAR GSE IS USED TO MEASURE THE DELAY.

C. FOR ANTENNA ALIGNMENT THE GSE (VAB, USB OR ETR, AS APPLICABLE) GENERATES SIGNALS THAT ARE FED THROUGH MSS ANTENNAS TO A LAB RECEIVER (IU COMMAND) OR A TRANSPONDER (RADAR). THE ANTENNAS ARE THEN ALIGNED FOR MAXIMUM RECEIVED SIGNAL.

REQUIREMENTS:

FLIGHT: NONE
GSE: MSS PARKED IN CHECKOUT POSITION AT PAD 39B
SAFETY: THE BUDDY SYSTEM WILL BE USED FOR OPERATIONS ON VAB ROOF AND ON MSS ANTENNAS.
SAFETY GLASSES MUST BE WORN ON VAB ROOF.

PHASE: V

TEST REQUIREMENTS
MSFC: N/A

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
A	10/25/72	REVISE BLOCKS 5 & 16	John E. Washburn	

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
John E. Washburn	IBM-967	6-5-72
10. NASA-KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
[illegible]	LV-IA's-1	6-19-72

KSC FORM 23-338 (7 67)

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APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
RF ANTENNA ORIENTATION AND MSS CABLE CHECKS

2. KSC TEST NUMBER
V-28234

3. EFFECTIVITY
AS-206 & SUBS

13. LOCATION
VAB ROOF 26B7, MSS

14. COMPUTER PROG. IDENTIFICATION
N/A

15. EST. TEST TIME
5 MEN - 16 HOURS

16. SUPPORT REQUIREMENTS

RD 41460

INTERSTAGE: NONE

OFF-COMPLEX: OPEN LOOP FREQUENCY CLEARANCE FOR 450 MHZ, 5690 MHZ, AND 5765 MHZ, ETR RADAR SUPPORT, GMIL SUPPORT.

ON-COMPLEX: FACILITY OIS, QUALITY INSPECTOR.

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

NONE

18. ITEM CONTINUATION

204

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KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE ____ OF ____

1. TEST TITLE
MAINTENANCE AND REPAIR OF MANSFIELD AND GREEN MODEL 10 HYDRAULIC PRESSURE TEST UNIT

2. KSC TEST NUMBER
V-30049

3. EFFECTIVITY
GSE

4. TEST OBJECTIVES
TO MAINTAIN, REPAIR AND FUNCTIONALLY TEST THE HYDRAULIC PRESSURE TEST UNIT.

5. TEST DESCRIPTION/EQUIPMENT STATUS/CONFIGURATION

THIS TEST [X] DOES [ ] DOES NOT *CONTAIN HAZARDOUS OPERATIONS.* IT IS CLASSED A STANDBY

PRIME TEST ORGANIZATION IS MECHANICAL SYSTEMS LABORATORY

TEST PARTS ARE - DISASSEMBLY
INSPECTION
CLEANING
LUBRICATION
REASSEMBLY
FUNCTIONAL TEST
PACKAGING

TEST REQUIREMENTS
NA

6. REV.	DATE	REASON	Contractor Approval	KSC Approval

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
Kenneth L. Kuntz	BATC 5-8534	10/25/67
10. NASA-KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
T. C. Hill	LV-MCC-4	2 NOV 67

KSC FORM 23.338 (7/67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2/2 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF MANSFIELD AND GREEN MODEL 10 HYDRAULIC PRESSURE TEST UNIT

2. KSC TEST NUMBER
V-30049

3. EFFECTIVITY
GSE

13. LOCATION	14. COMPUTER PROC. INDENTIFICATION	15. EST. TEST TIME
VAB 1K	NA	

16. SUPPORT REQUIREMENTS

GN_2
GHE
SPARE PARTS
SPECIAL TOOLS AS REQUIRED
CLEANING REQUIREMENT
FUNCTIONAL TEST EQUIPMENT
ENVIRONMENTALLY CONTROLLED AREA

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF ____

1. TITLE
MAINTENANCE AND REPAIR OF NASA P/N 75M05869 LCLV-5, VALVE CONTROL, PNEUMATIC OPERATED, LOX SYSTEM
ARNIN COMPANY

2. KSC TEST NUMBER
V-30050

3. EFFECTIVITY
GSE

4. TEST OBJECTIVES

TO MAINTAIN, REPAIR AND FUNCTIONALLY TEST THE FOLLOWING VALVE:

NASA P/N	VENDOR P/N
75M05869 LCLV-5	4491
	4805
	1377

5. TEST DESCRIPTION/EQUIPMENT STATUS/CONFIGURATION

THIS TEST ☒ DOES ☐ DOES NOT *CONTAIN HAZARDOUS OPERATIONS.* IT IS CLASSED A STANDBY.

PRIME TEST ORGANIZATION IS MECHANICAL SYSTEMS LABORATORY.

TEST PARTS ARE - DISASSEMBLY
INSPECTION
CLEANING
LUBRICATION
REASSEMBLY
FUNCTIONAL TEST
PACKAGING

PHASE NA

TEST REQUIREMENTS
NA

CANCELLED

REV.	DATE	REASON	Contractor Approval	KSC Approval
A	5-30-74	Cancel - Requirement Deleted	R.E. Ackroyd 5/30/74	

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
	BATC 5-8534	10/25/61
10. NASA-KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
	LV-MSC-1	2 NOV 61

KSC FORM 28-338 (7/67)

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KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF NASA P/N 75M00799, VALVE, VENT CHECK MAROTTA VALVE CORPORATION P/N 232783, MODEL CV33

2. KSC TEST NUMBER
V-30055

3. EFFECTIVITY
GSE

4. TEST OBJECTIVES

TO MAINTAIN, REPAIR AND FUNCTIONALLY TEST THE VALVE.

5. TEST DESCRIPTION/EQUIPMENT STATUS/CONFIGURATION

THIS TEST ☒ DOES ☐ DOES NOT *CONTAIN HAZARDOUS OPERATIONS.* IT IS CLASSED A STANDBY

PRIME TEST ORGANIZATION IS MECHANICAL SYSTEMS LABORATORY

TEST PARTS ARE - DISASSEMBLY
INSPECTION
CLEANING
LUBRICATION
REASSEMBLY
FUNCTIONAL TEST
PACKAGING

TEST REQUIREMENTS
NA

6. REV.	DATE	REASON	Contractor Approval	KSC Approval

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
F. L. KUTCH	BATC 5-8534	NOVEMBER 10, 1967
10. NASA-KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
D. A. SCOVILLE	LV-MEC-1	11/14/67

NSC FORM 23 338 (7/67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF NASA P/N 75M00799, VALVE, VENT CHECK MAROTTA VALVE CORPORATION P/N 232783, MODEL CV33

2. KSC TEST NUMBER
V-30055

3. EFFECTIVITY
GSE

13. LOCATION	14. COMPUTER PROC. INDENTIFICATION	15. EST. TEST TIME
VAB 1K11	NA	24 HOURS

16. SUPPORT REQUIREMENTS

GN_2
GHE
SPARE PARTS
SPECIAL TOOLS AS REQUIRED
CLEANING EQUIPMENT
FUNCTIONAL TEST EQUIPMENT
ENVIRONMENTALLY CONTROLLED AREA

17. OTHER APPLICABLE REFERENCE DOCUMENTATION
6-BLGSEV-3970

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
. MAINTENANCE AND REPAIR OF VALVE, SOLENOID, NASA P/N 75M11869, MAROTTA VALVE CORPORATION, MODEL 100AS

2. KSC TEST NUMBER
V-30066

3. EFFECTIVITY
GSE

4. TEST OBJECTIVES

To describe the maintenance, repair and functional testing of the following valve:

NASA P/N	VENDOR P/N
75M11869	Model 100AS

5. TEST DESCRIPTION/EQUIPMENT STATUS/CONFIGURATION

THIS TEST [X] DOES [ ] DOES NOT *CONTAIN HAZARDOUS OPERATIONS.* It is classed a standby

Prime test organization is Mechanical Systems Laboratory

Test Parts are: Disassembly
Inspection
Cleaning
Lubrication
Reassembly
Functional Test
Packaging

Test Requirements

NA

6. REV.	DATE	REASON	Contractor Approval	KSC Approval

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
F. L. Kutch	BATC 5-8534	11/15/67
10. NASA-KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
D. A. Scoville	LV-MEC-1	11/16/67

KSC FORM 23-338 (7-67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF VALVE, SOLENOID, NASA P/N 75M11869, MAROTTA VALVE CORPORATION, MODEL 100AS

2. KSC TEST NUMBER
V-30066

3. EFFECTIVITY
GSE

13. LOCATION	14. COMPUTER PROC. INDENTIFICATION	15. EST. TEST TIME
VAB 1K11	NA	24 Hours

16. SUPPORT REQUIREMENTS

GN2
GHe
Spare Parts
Special Tools are required
Cleaning Equipment
Functional Test Equipment
Environmentally controlled area

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

6-BLGSEV-3981

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
/75M14522 LBFV-1
MAINTENANCE AND REPAIR OF NASA P/N 75M05869 LBFV-1 VALVE, CRYOGENIC HANDLING, BUTTERFLY B. H. HADLEY, INC.

2. KSC TEST NUMBER
V-30079

3. EFFECTIVITY
AS REQUIRED

4. TEST OBJECTIVES

TO MAINTAIN, REPAIR AND FUNCTIONALLY TEST THE VALVE.

5. TEST DESCRIPTION EQUIPMENT STATUS/CONFIGURATION

THIS TEST [X] DOES [ ] DOES NOT *CONTAIN HAZARDOUS OPERATIONS.* IT IS CLASSED A STANDBY.

PRIME TEST ORGANIZATION IS MECHANICAL SYSTEMS LABORATORY.

TEST PARTS ARE - DISASSEMBLY
INSPECTION
CLEANING
LUBRICATION
REASSEMBLY
FUNCTIONAL TEST
PACKAGING

TEST REQUIREMENTS

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
A	8-9-68	ADD NASA P/N 75M14522 LBFV-1 DELETE VENDOR P/N. REVISE EFFECTIVITY.	D. A. Stilley	

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
E. C. KUTCH	BATC 5-8534	NOVEMBER 9, 1967
10. NASA KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
	LV-MEC-1	11/14/67

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
75M14522 LBFV-1
MAINTENANCE AND REPAIR OF NASA P/N 75M05869 LBFV-1 VALVE, CRYOGENIC HANDLING, BUTTERFLY B. H. HADLEY, INC.

2. KSC TEST NUMBER
V-30079

3. EFFECTIVITY
AS REQUIRED

13. LOCATION	14. COMPUTER PROC. INDENTIFICATION	15. EST. TEST TIME
VAB 1K11	NA	24 HOURS

16. SUPPORT REQUIREMENTS

GN_2
GH_E
SPARE PARTS
SPECIAL TOOLS AS REQUIRED
CLEANING REQUIREMENT
FUNCTIONAL TEST EQUIPMENT
ENVIRONMENTALLY CONTROLLED AREA

17. OTHER APPLICABLE REFERENCE DOCUMENTATION
6-BLGSEV-3562

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF REGULATOR 3/8" PNEUMATIC SYSTEM, MAROTTA VALVE CORP., P/N 219004-B-155, J-151 AND B-111 MODEL RV-31, NASA P/N 75M08830-1, -2, -3

2. KSC TEST NUMBER
V-30088

3. EFFECTIVITY
GSE

4. TEST OBJECTIVES

To maintain,repair and functionally test the following regulator:

NASA P/N	VENDOR P/N
75M08830-3	219004-B-111
75M08830-1 & 75M08830-2	219004-B-155
	219004-J-151
	Model RV-31

5. TEST DESCRIPTION/EQUIPMENT STATUS/CONFIGURATION

THIS TEST [XX] DOES [ ] DOES NOT *CONTAIN HAZARDOUS OPERATIONS.* It is classed a standby.

Prime test organization is Mechanical Systems Laboratory.

Test parts are: Disassembly
Inspection
Cleaning
Lubrication
Reassembly
Functional Test
Packaging

Test Requirements

NA

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
A	2-26-68	CORRECT & ADD P/N'S PER REV. G 75M08830	J.A. Ethington	Donald Scoville 2-26-68

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
F.L. Kutch	BATC 5-8534	11/13/67
10. NASA-KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
D.A. Scoville	LV-MEC-1	11/14/67

KSC FORM 23-338 7 67I

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF REGULATOR 3/8" PNEUMATIC SYSTEM, MAROTTA VALVE CORP., P/N 219004-B155, J-151 AND B-111 MODEL RV-31, NASA P/N 75M08830-1, -2 -3

2. KSC TEST NUMBER
V-30088

3. EFFECTIVITY
GSE

13. LOCATION
VAB 1K 11

14. COMPUTER PROC. INDENTIFICATION
NA

15. EST. TEST TIME
24 hours

16. SUPPORT REQUIREMENTS

GN2
GHe
Spare parts
Special tools as required
Cleaning requirement
Functional test equipment
Environmentally controlled area

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

6-BLGSEV-3581

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF NASA P/N 75M09286
VALVE, RELIEF, MAROTTA VALVE CORP. P/N 231074

2. KSC TEST NUMBER
V-30090

3. EFFECTIVITY
GSE

4. TEST OBJECTIVES

TO MAINTAIN, REPAIR AND FUNCTIONALLY TEST THE FOLLOWING VALVE:

NASA P/N	VENDOR P/N	
75M09286	231074	MODEL PRV4M

5. TEST DESCRIPTION/EQUIPMENT STATUS/CONFIGURATION

THIS TEST ☒ DOES ☐ DOES NOT *CONTAIN HAZARDOUS OPERATIONS.* IT IS CLASSED A STANDBY.

PRIME TEST ORGANIZATION IS MECHANICAL SYSTEMS LABORATORY.

TEST PARTS ARE - DISASSEMBLY
INSPECTION
CLEANING
LUBRICATION
REASSEMBLY
FUNCTIONAL TEST
PACKAGING

TEST REQUIREMENTS
NA

REV.	DATE	REASON	Contractor Approval	KSC Approval
B	4-15-68	DELETE -22, -23, NOT REQUIRED	A.E. Ethington	Donald Scoville
A	3-11-68	75M17331 INCORPORATED INTO 75M09286	A.E. Ethington	Donald Scoville

7. CONTRACTOR APPROVAL
F. L. KUTCH

8. ORGANIZATION
BATC 5-8534

9. DATE
NOVEMBER 9, 1967

10. NASA-KSC APPROVAL
D. A. SCOVILLE

11. ORGANIZATION
LV-MEC-1

12. APPROVAL DATE
11/14/67

KSC FORM 23-338 (7-67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF NASA P/N 75M09286
VALVE, RELIEF, MAROTTA VALVE CORP. P/N 231074

2. KSC TEST NUMBER
V-30090

3. EFFECTIVITY
GSE

13. LOCATION
VAB 1K11

14. COMPUTER PROC. INDENTIFICATION
NA

15. EST. TEST TIME
24 HOURS

16. SUPPORT REQUIREMENTS

GN_2
GH_E
SPARE PARTS
SPECIAL TOOLS AS REQUIRED
CLEANING EQUIPMENT
FUNCTIONAL TEST EQUIPMENT
ENVIRONMENTALLY CONTROLLED AREA

17. OTHER APPLICABLE REFERENCE DOCUMENTATION
6-BLGSEV-3585

18. ITEM CONTINUATION

211

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF NASA P/N 75M09285, SOLENOID VALVE 3-WAY, 2-POSITION, MAROTTA VALVE CORP. P/N 806098

2. KSC TEST NUMBER
V-30098

3. EFFECTIVITY
GSE

4. TEST OBJECTIVES
TO MAINTAIN, REPAIR AND FUNCTIONALLY TEST THE FOLLOWING VALVE:

NASA P/N	VENDOR P/N
75M09285	806098, MV-583H-2A

5. TEST DESCRIPTION/EQUIPMENT STATUS/CONFIGURATION

THIS TEST [X] DOES [ ] DOES NOT *CONTAIN HAZARDOUS OPERATIONS.* IT IS CLASSED A STANDBY

PRIME TEST ORGANIZATION IS MECHANICAL SYSTEMS LABORATORY.

TEST PARTS ARE - DISASSEMBLY
INSPECTION
CLEANING
LUBRICATION
REASSEMBLY
FUNCTIONAL TEST
PACKAGING

TEST REQUIREMENTS
NA

6. REV.	DATE	REASON	Contractor Approval	KSC Approval

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
F. L. KUTCH	BATv 34	NOVEMBER 9, 1967
10. NASA-KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
D. A. SCOVILLE	LV-MEC-1	11/14/67

KSC FORM 23-338 (7-67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF NASA P/N 75M09285, SOLENOID VALVE, 3-WAY 2=POSITION, MAROTTA VALVE CORP. P/N 806098

2. KSC TEST NUMBER
V-30098

3. EFFECTIVITY
GSE

13. LOCATION	14. COMPUTER PROG. INDENTIFICATION	15. EST. TEST TIME
VAB 1K11	NA	24 HOURS

16. SUPPORT REQUIREMENTS

GN_2
GHE
SPARE PARTS
SPECIAL TOOLS AS REQUIRED
CLEANING EQUIPMENT
FUNCTIONAL TEST EQUIPMENT
ENVIRONMENTALLY CONTROLLED AREA

17. OTHER APPLICABLE REFERENCE DOCUMENTATION
6-BLGSEV-3599

18. ITEM CONTINUATION

2.12

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE

MAINTENANCE AND REPAIR OF FILTER, HYDRAULIC SYSTEM, MARVEL ENGINEERING COMPANY, P/N C-1-10 NASA P/N 75M06607

2. KSC TEST NUMBER: V-30103

3. EFFECTIVITY: GSE

4. TEST OBJECTIVES

To maintain, repair and functionally test the following filter:

NASA P/N	VENDOR P/N
75M06607	C-1-10

5. TEST DESCRIPTION/EQUIPMENT STATUS/CONFIGURATION

THIS TEST XX ☐ DOES ☐ DOES NOT CONTAIN HAZARDOUS OPERATIONS. It is classed a standby.

Prime test organization is Mechanical Systems Laboratory.

Test parts are: Disassembly
Inspection
Cleaning
Lubrication
Reassembly
Functional test
Packaging

Test Requirements

NA

6. REV.	DATE	REASON	Contractor Approval	KSC Approval

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
F.L. Kutch	BATC 5-8534	11/13/67
10. NASA-KSC APPROVAL: D.A. Scoville	11. ORGANIZATION: LV-MEC-1	12. APPROVAL DATE: 11/14/67

KSC FORM 21-336 (7 67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE

MAINTENANCE AND REPAIR OF FILTER, HYDRAULIC SYSTEM, MARVEL ENGINEERING CO., P/N C-1-10 NASA P/N 75M06607

2. KSC TEST NUMBER: V-30103

3. EFFECTIVITY: GSE

13. LOCATION	14. COMPUTER PROC. INDENTIFICATION	15. EST. TEST TIME
VAB 1K 11	NA	24 hours

16. SUPPORT REQUIREMENTS

GN2
GHe
Spare parts
Special tools as required
Cleaning requirement
Functional test equipment
Environmentally controlled area

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

6-BLGSEV-3608

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF VALVE, LOX SYSTEM, PACIFIC VALVES, INC., P/N S8551EB(6)-12T
NASA P/N 75M05869 LGV-7

2. KSC TEST NUMBER
V-30112

3. EFFECTIVITY
GSE

4. TEST OBJECTIVES
To maintain, repair, and functionally test valve:

NASA P/N	VENDOR P/N
75M05869 LGV-7	S8551EB(6)-12T

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST [X] DOES [ ] DOES NOT CONTAIN HAZARDOUS OPERATIONS. It is classed a standby.

Prime test organization is Mechanical Systems Laboratory.

Test parts are - Disassembly
Inspection
Cleaning
Lubrication
Reassembly
Functional Test
Packaging

Test Requirements

NA

6. REV.	DATE	REASON	Contractor Approval	KSC Approval

7. CONTRACTOR APPROVAL
F. L. Kutch

8. ORGANIZATION
BATC 5-8534

9. DATE
11/13/67

10. NASA KSC APPROVAL
D. A. Scoville

11. ORGANIZATION
LV-MEC-1

12. APPROVAL DATE
11/14/67

KSC FORM 23 316 (7 67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF VALVE, LOX SYSTEM, PACIFIC VALVE, INC., P/N S8551EB(6)-12T
NASA P/N 75M05869 LGV-7

2. KSC TEST NUMBER
V-30112

3. EFFECTIVITY
GSE

13. LOCATION
VAB 1K11

14. COMPUTER PROC. INDENTIFICATION
NA

15. EST. TEST TIME
24 hours

16. SUPPORT REQUIREMENTS

GN2
GHe
Spare Parts
Special tools as required
Cleaning requirement
Functional test equipment
Environmental controlled area

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

6-BLGSEV-3622-A

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TITLE
MAINTENANCE AND REPAIR OF NASA P/N 64-K-F-364, VALVE, MANUAL VACCO VALVE COMPANY P/N M-6P-X465-2G

2. KSC TEST NUMBER
V-30115

3. EFFECTIVITY
GSE

4. TEST OBJECTIVES
TO MAINTAIN, REPAIR AND FUNCTIONALLY TEST THE FOLLOWING VALVE:

NASA P/N	VENDOR P/N
64-K-F-364 CODE 2-1-V-G	M-6P-X465-2G

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST [X] DOES [ ] DOES NOT *CONTAIN HAZARDOUS OPERATIONS.* IT IS CLASSED A STANDBY:

PRIME TEST ORGANIZATION IS MECHANICAL SYSTEMS LABORATORY

TEST PARTS ARE - DISASSEMBLY
INSPECTION
CLEANING
LUBRICATION
REASSEMBLY
FUNCTIONAL TEST
PACKAGING

PHASE NA

TEST REQUIREMENTS
NA

CANCELLED

6.	DATE	REASON	Contractor Approval	KSC Approval
A	6-8-77	CANCEL THIS PROCEDURE -- EQUIPMENT IS NO LONGER USED ON THIS PROGRAM	6/13/77	6/21/77

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
F. L. KUTCH	BATC 5-8534	NOVEMBER 9, 1967
10. NASA-KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
J. A. SCOVILLE	LV-MEC-1	11/14/67

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APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF NASA P/N 64-K-F-364, VALVE, MANUAL VACCO VALVE COMPANY P/N M-6P-X465

2. KSC TEST NUMBER
V-30115

3. EFFECTIVITY
GSE

13. LOCATION	14. COMPUTER PROC. INDENTIFICATION	15. EST. TEST TIME
VAB 1K11	NA	24 HOURS

16. SUPPORT REQUIREMENTS
GN_2
GH_E
SPARE PARTS
SPECIAL TOOLS AS REQUIRED
CLEANING EQUIPMENT
FUNCTIONAL TEST EQUIPMENT
ENVIRONMENTALLY CONTROLLED AREA

17. OTHER APPLICABLE REFERENCE DOCUMENTATION
6-BLGSEV-3625

18. ITEM CONTINUATION

CANCELLED

178

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KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF NEEDLE VALVE, HI-PRESSURE, 10,000 PSI, PANEL MOUNTING, NASA P/N 75M06582-12, REPUBLIC MANUFACTURING COMPANY, P/N 154-12SS27P

2. KSC TEST NUMBER
V-30124

3. EFFECTIVITY
AS REQUIRED

4. TEST OBJECTIVES

To maintain, repair and functionally test the following valve:

NASA P/N	VENDOR P/N
75M06582-12	154-12SS27P

5. TEST DESCRIPTION/EQUIPMENT STATUS/CONFIGURATION

THIS TEST [XX] DOES [ ] DOES NOT CONTAIN HAZARDOUS OPERATIONS. It is classed a standby.

Prime test organization is Mechanical Systems Laboratory.

Test Parts are - Disassembly
Inspection
Cleaning
Lubrication
Reassembly
Functional Test
Packaging

Test Requirements NA

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
A		CHANGE VENDOR P/N CHANGE EFFECTIVITY	J. A. Ethington	D. A. Scoville

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
F. L. Kutch	BATC 5-8534	11/13/67
10. NASA-KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
D. A. Scoville	LV-MEC-1	11/14/67

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF NEEDLE VALVE, HI-PRESSURE, 10,000 PSI, PANEL MOUNTING, NASA P/N 75M06582-12, REPUBLIC MANUFACTURING COMPANY, P/N 154-12SS27P

2. KSC TEST NUMBER
V-30124

3. EFFECTIVITY
AS REQUIRED

13. LOCATION
VAB 1K11

14. COMPUTER PROC. INDENTIFICATION
NA

15. EST. TEST TIME
24 hours

16. SUPPORT REQUIREMENTS

GN2
GHe
Spare Parts
Special tools as required
Cleaning requirement
Functional test equipment
Environmental controlled area

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

6-BLGSEV-3643

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF BACK PRESSURE VALVE, NASA P/N 75M08819, RIVETT, INC., P/N 2818-10 Z2764A

2. KSC TEST NUMBER
V-30129

3. EFFECTIVITY
GSE

4. TEST OBJECTIVES

To maintain, repair and functionally test the following valve:

NASA P/N	VENDOR P/N
75M08819	2818-10 Z2764A

5. TEST DESCRIPTION/EQUIPMENT STATUS/CONFIGURATION

THIS TEST [XX] DOES [ ] DOES NOT CONTAIN HAZARDOUS OPERATIONS. It is classed a standby.

Prime test organization is Mechanical Systems Laboratory.

Test Parts are - Disassembly
Inspection
Cleaning
Lubrication
Reassembly
Functional Test
Packaging

Test Requirements NA

6. REV.	DATE	REASON	Contractor Approval	KSC Approval

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
F. L. Kitch	BATC 5-8534	11/13/67
10. NASA-KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
D. A. Scoville	LV-MEC-1	11/14/67

KSC FORM 23-338 (7-67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF BACK PRESSURE VALVE, NASA P/N 75M08819, RIVETT, INC., P/N 2818-10 Z2764A

2. KSC TEST NUMBER
V-30129

3. EFFECTIVITY
GSE

13. LOCATION	14. COMPUTER PROG. INDENTIFICATION	15. EST. TEST TIME
VAB 1K11	NA	24 hours

16. SUPPORT REQUIREMENTS

GN2
GHe
Spare Parts
Special tools as required
Cleaning requirement
Functional test equipment
Environmental controlled area

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

6-BLGSEV-3649-A

18. ITEM CONTINUATION

211

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KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF MANIFOLD, LOADING, SOLENOID OPERATED, DELUGE WATER SYSTEM, NASA P/N 64-K-F-364, SHEETS 9, 15 AND 16, GROVE VALVE AND REGULATOR COMPANY, P/N M-14003-D

2. KSC TEST NUMBER
V-30147

3. EFFECTIVITY
GSE

4. TEST OBJECTIVES
TO DESCRIBE THE MAINTENANCE, REPAIR AND FUNCTIONAL TESTING OF THE WATER SYSTEM:

NASA P/N	VENDOR P/N
64-K-F-364, SHEETS 9, 15 AND 16	M-14003-D

5. TEST DESCRIPTION/EQUIPMENT STATUS/CONFIGURATION

THIS TEST [XX] DOES [ ] DOES NOT CONTAIN HAZARDOUS OPERATIONS. It is classed a standby.

Prime test organization is Mechanical Systems Laboratory.

Test parts are - Disassembly
Inspection
Cleaning
Lubrication
Functional Test
Packaging

Test Requirements NA

6. REV.	DATE	REASON	Contractor Approval	KSC Approval

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
F. L.	BATC 5-34	11/13/67
10. NASA-KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
D. A. Coville	LV-MEC-1	11/14/67

KSC FORM 23-338 (7/67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF MANIFOLD, LOADING, SOLENOID OPERATED, DELUGE WATER SYSTEM, NASA P/N 64-K-F-364, SHEETS 9, 15 AND 16, GROVE VALVE AND REGULATOR COMPANY, P/N M-14003-D

2. KSC TEST NUMBER
V-30147

3. EFFECTIVITY
GSE

12. LOCATION
VAB 1K 11

14. COMPUTER PROG. IDENTIFICATION
NA

15. EST. TEST TIME
24 hours

16. SUPPORT REQUIREMENTS
GN2
GHe
Spare parts
Special tools as required
Cleaning equipment
Functional test equipment
Environmentally controlled area

17. OTHER APPLICABLE REFERENCE DOCUMENTATION
6-BLGSEV-3689

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR PRESSURE REDUCING, REGULATOR, NASA P/N 64-K-F-364, GROVE VALVE AND REGULATOR COMPANY, P/N M-13947-W MODEL 211P

2. KSC TEST NUMBER
V-30148

3. EFFECTIVITY
GSE

4. TEST OBJECTIVES
TO DESCRIBE THE MAINTENANCE, REPAIR AND FUNCTIONAL TESTING OF THE REGULATOR:

NASA P/N	VENDOR P/N
64-K-F-364	M-13947-W, MODEL 211P

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST [X] DOES [ ] DOES NOT CONTAIN HAZARDOUS OPERATIONS. It is classed a standby.

Prime test organization is Mechanical Systems Laboratory.

Test parts are - Disassembly
Inspection
Cleaning
Lubrication
Reassembly
Functional test
Packaging

Phase NA

Test Requirements NA

CANCELLED

6.	DATE	REASON	Contractor Approval	KSC Approval
A	6-3-74	CANCEL THIS PROCEDURE -- COMPONENT IS NO LONGER USED ON THIS PROGRAM	6/3/74	6/3/74

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
F. L. Kutch	BATC 5-8534	11/13/67
10. NASA-KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
D. A. Scoville	LV-MEC-1	11/14/67

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KSC FORM 23-330 7/67

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF PRESSURE REDUCING, REGULATOR, NASA P/N 64-K-F-364, GROVE VALVE AND REGULATOR COMPANY, P/N M-13947-W MODEL 211P

2. KSC TEST NUMBER
V-30148

3. EFFECTIVITY
GSE

13. LOCATION	14. COMPUTER PROC. INDENTIFICATION	15. EST. TEST TIME
VAB 1K 11	NA	24 hours

16. SUPPORT REQUIREMENTS

GN2
GHe
Spare parts
Special tools as required
Cleaning equipment
Functional test equipment
Environmentally controlled area

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

6-BLGSEV-3692

18. ITEM CONTINUATION

CANCELLED

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF PRESSURE REDUCING REGULATOR DELUGE WATER SYSTEM, NASA P/N 64-K-F-364 SHEET 4, GROVE VALVE AND REGULATOR COMPANY, P/N M-13940-AJ

2. KSC TEST NUMBER: V-30149

3. EFFECTIVITY: GSE

4. TEST OBJECTIVES

TO DESCRIBE THE MAINTENANCE, REPAIR, AND FUNCTIONAL TESTING OF THE REGULATOR:

NASA P/N	VENDOR P/N
64-K-F-364 SHEET 4	M-13940-AJ

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST ☒ DOES ☐ DOES NOT *CONTAIN HAZARDOUS OPERATIONS.* IT IS CLASSED A STANDBY

PRIME TEST ORGANIZATION IS MECHANICAL SYSTEMS LABORATORY.

TEST PARTS ARE:
DISASSEMBLY
INSPECTION
CLEANING
LUBRICATION
REASSEMBLY
FUNCTIONAL TEST
PACKAGING

PHASE NA

TEST REQUIREMENTS NA

NOTE: DUPLICATE - ORIGINAL MISPLACED

CANCELLED

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
A	5-28-74	CANCEL THIS CAT SHEET. COMPONENT IS NO LONGER ACTIVE IN SYSTEM. NO MSL WORK PLANNED	J. V. Fuller	

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
s/F. L. Kutch	BATC 5-8534	11-13-67
10. NASA KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
s/D. A. Scoville	LV-MEC-1	11-14-67

KSC FORM 23.338 (7-67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF PRESSURE REDUCING REGULATOR DELUGE WATER SYSTEM, NASA P/N 64-K-F-364 SHEET 4, GROVE VALVE AND REGULATOR COMPANY, P/N M-13940-AJ

2. KSC TEST NUMBER: V-30149

3. EFFECTIVITY: GSE

13. LOCATION: VAB 1K11

14. COMPUTER PROC. INDENTIFICATION: NA

15. EST. TEST TIME: 24 HOURS

16. SUPPORT REQUIREMENTS

GN_2
GHe
Spare Parts
Special tools as required
Cleaning equipment
Functional test equipment
Environmentally controlled area

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

6-BLGSEV-3693

18. ITEM CONTINUATION

CANCELLED

220

184

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF VALVE, BALL, MANUAL, 1" WATER METHANOL SYSTEM, (SERVICE ARMS), NASA P/N 75M07192-1, KOEHLER AIRCRAFT PRODUCTS COMPANY, P/N 3-116815-16

2. KSC TEST NUMBER
V-30150

3. EFFECTIVITY
GSE

4. TEST OBJECTIVES

TO DESCRIBE THE MAINTENANCE, REPAIR AND FUNCTIONAL TESTING OF THE VALVE:

NASA P/N	VENDOR P/N
75M07192-1	3-116815-16

5. TEST DESCRIPTION/EQUIPMENT STATUS/CONFIGURATION

THIS TEST [XX] DOES [ ] DOES NOT *CONTAIN HAZARDOUS OPERATIONS.* It is classed a standby.

Prime test organization is Mechanical Systems Laboratory.

Test parts are - Disassembly
Inspection
Cleaning
Lubrication
Functional test
Packaging

Test Requirements NA

6. REV.	DATE	REASON	Contractor Approval	KSC Approval

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
F. L. Kutch	BATC 5-8534	11/13/67
10. NASA-KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
D. A. Ville	LV-MEC-1	11/14/67

KSC FORM [illegible] (7/67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF VALVE, BALL, MANUAL, 1" WATER METHANOL SYSTEM, (SERVICE ARMS), NASA P/N 75M07192-1, KOEHLER AIRCRAFT PRODUCTS COMPANY, P/N 3-116815-16

2. KSC TEST NUMBER
V-30150

3. EFFECTIVITY
GSE

13. LOCATION	14. COMPUTER PROG. IDENTIFICATION	15. EST. TEST TIME
VAB 1K 11	NA	24 hours

16. SUPPORT REQUIREMENTS

GN2
GHe
Spare parts
Special tools as required
Cleaning equipment
Functional test equipment
Environmentally controlled area

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

6-BLGSEV-3694

18. ITEM CONTINUATION

.221

REV 32

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

2. KSC TEST NUMBER V-30166

EFFECTIVITY GSE

MAINTENANCE AND REPAIR OF NASA P/N 75M05869 LRV-7
VALVE, ..., J. E. LONERGAN COMPANY, MODEL 42W209M

To maintain, repair and functionally test valve:

NASA P/N	VENDOR P/N
75M05869 LRV-7	MODEL 42W209M

This test ... DOES NOT CONTAIN HAZARDOUS OPERATIONS. It is classed a standby.

Prime test organization is Mechanical Systems Laboratory.

Test parts are - Disassembly
Inspection
Cleaning
Lubrication
Reassembly
Functional Test
Packaging

Test Requirements

NA

CANCELLED

B 5-30-74 Cancel - Requirement Deleted

A 5-18-... ... NASA P/N WITH SPECIFICATION ADDITION

REASON | Contractor Approval | KSC Approval

ORGANIZATION: BATC 5-8534

DATE: 11/13/67

ORGANIZATION: LV-MEC-1

12. APPROVAL DATE: 11/14/67

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KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF SWITCH, PRESSURE, LIQUID HYDROGEN SYSTEM, CUSTOM COMPONENT COMPANY, P/N 603G1 AND 603G3 , NASA P/N 75M05752 HPS-1,-2,-3; 75M14524 HPS-1,-2,-3

2. KSC TEST NUMBER
V-30201

3. EFFECTIVITY
AS REQUIRED

4. TEST OBJECTIVES

To maintain, repair, and functionally test the following switch:

NASA P/N	VENDOR P/N
75M05752 HPS-1,-2,-3	603G1
75M14514 HPS-1,-2,-3	603G3

5. TEST DESCRIPTION/EQUIPMENT STATUS/CONFIGURATION

THIS TEST [X] DOES [ ] DOES NOT *CONTAIN HAZARDOUS OPERATIONS.* It is classed a standby.

Prime test organization is Mechanical Systems Laboratory.

Test parts are - Disassembly
Inspection
Cleaning
Lubrication
Reassembly
Functional Test
Packaging

Test Requirements NA

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
A	8-15-68	ADD NASA P/N 75M14524 HPS-1,-2,-3; ADD SIMILAR PARTS -2,-3; CHANGE EFFECTIVITY		

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
F.L. Kutch	BATC 5-8534	11/13/67
10. NASA KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
D.A. Scoville	LV-MEC-1	11/14/67

KSC FORM 21-114 7-67

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF SWITCH, PRESSURE, LIQUID HYDROGEN SYSTEM, CUSTOM COMPONENT COMPANY, P/N 603G1 AND 603G3 NASA P/N 75M05752 HPS-1,-2,-3; 75M14524 HPS-1,-2,-3

2. KSC TEST NUMBER
V-30201

3. EFFECTIVITY
AS REQUIRED

13. LOCATION	14. COMPUTER PROC. IDENTIFICATION	15. EST. TEST TIME
VAB 1K11	NA	24 hours

16. SUPPORT REQUIREMENTS

GN2
GHe
Spare Parts
Special tools as required
Cleaning Requirement
Functional test equipment
Environmental controlled area

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

6-BLGSEV-3828

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF VALVE, PILOT CONTROLLED HYDRAULIC BALL, NASA P/N 75M11861, FLODYNE CONTROLS, INC., P/N 15C19

2. KSC TEST NUMBER
V-30220

3. EFFECTIVITY
GSE

4. TEST OBJECTIVES

To describe the maintenance, repair and functional testing of the following valve:

NASA P/N	VENDOR P/N
75M11861	15C19

5. TEST DESCRIPTION/EQUIPMENT STATUS/CONFIGURATION

THIS TEST [X] DOES [ ] DOES NOT CONTAIN HAZARDOUS OPERATIONS. It is classed a standby.

Prime test organization is Mechanical Systems Laboratory.

Test Parts are - Disassembly
Inspection
Cleaning
Lubrication
Reassembly
Functional Test
Packaging

Test Requirements NA

6. REV.	DATE	REASON	Contractor Approval	KSC Approval

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
T. L. Rutch	BATC S-85	11/13/67
10. NASA KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
D. A. Scoville	LV-MEC-1	11/14/67

KSC FORM 23 138 (7/67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF VALVE, PILOT CONTROLLED HYDRAULIC BALL, NASA P/N 75M11861, FLODYNE CONTROLS, INC., P/N 15C19

2. KSC TEST NUMBER
V-30220

3. EFFECTIVITY
GSE

13. LOCATION	14. COMPUTER PROC. INDENTIFICATION	15. EST. TEST TIME
VAB 1K11	NA	24 hours

16. SUPPORT REQUIREMENTS

GN_2
GHe
Spare Parts
Special tools as required
Cleaning requirement
Functional test equipment
Environmental controlled area

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

6-BLGSEV-3943

18. ITEM CONTINUATION

224

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF CYLINDER, HYDRAULIC
NASA P/N 75M12157, PATHON MANUFACTURING COMPANY

2. KSC TEST NUMBER
V-30225

3. EFFECTIVITY
GSE

4. TEST OBJECTIVES

To describe the maintenance, repair and functional testing of the following cylinder:

NASA P/N	VENDOR P/N
75M12157	

5. TEST DESCRIPTION/EQUIPMENT STATUS/CONFIGURATION

THIS TEST [X] DOES [ ] DOES NOT CONTAIN HAZARDOUS OPERATIONS. It is classed a standby.

Prime test organization is Mechanical Systems Laboratory.

Test Parts are - Disassembly
Inspection
Cleaning
Lubrication
Reassembly
Functional Test
Packaging

Test Requirements ...

6. REV.	DATE	REASON	Contractor Approval	KSC Approval

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
F. L. Kutch	BATC 5-8534	11/13/67
10. NASA-KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
D. A. Scoville	LV-MEC-1	11/14/67

KSC FORM 23-334 (7/67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF CYLINDER, HYDRAULIC,
NASA P/N 75M12157, PATHON MANUFACTURING COMPANY

2. KSC TEST NUMBER
V-30225

3. EFFECTIVITY
GSE

13. LOCATION	14. COMPUTER PROC. INDENTIFICATION	15. EST. TEST TIME
VAB 1K11	NA	24 hours

16. SUPPORT REQUIREMENTS

GN2
GHe
Spare Parts
Special tools as required
Cleaning requirement
Functional test equipment
Environmental controlled area

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

6-BLGSEV-3947

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF NASA P/N 75M14551, 76K02549 SOLENOID VALVE, MAROTTA VALVE CORP. P/N 229654, MODEL MV 159KC

2. KSC TEST NUMBER
V-30258

3. EFFECTIVITY
GSE

4. TEST OBJECTIVES
TO MAINTAIN, REPAIR AND FUNCTIONALLY TEST THE VALVE.

5. TEST DESCRIPTION/EQUIPMENT STATUS/CONFIGURATION

THIS TEST [X] DOES [ ] DOES NOT CONTAIN HAZARDOUS OPERATIONS. IT IS CLASSED A STANDBY

PRIME TEST ORGANIZATION IS MECHANICAL SYSTEMS LABORATORY.

TEST PARTS ARE - DISASSEMBLY
INSPECTION
CLEANING
LUBRICATION
REASSEMBLY
FUNCTIONAL TEST
PACKAGING

TEST REQUIREMENTS

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
A	2-14-68	DELETE NASA P/N 10437737-2 DISSIMILAR VALVE ADD 76K02549 SIMILAR VALVE. DELETE VENDOR P/N 229644-12, MV-159KA	2/15/68	2-16-68

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
F. L. KUTCH	BATC-5-8534	NOVEMBER 13, 1967
10. NASA-KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
D. A. SCOVILLE	LV-MEC-1	11/16/67

KSC FORM 23-330 (7/67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF NASA P/N 75M14551, 76K02549 SOLENOID VALVE, MAROTTA VALVE CORP. P/N 229654, MODEL MV159KC

2. KSC TEST NUMBER
V-30258

3. EFFECTIVITY
GSE

13. LOCATION
VAB 1K11

14. COMPUTER PROC. INDENTIFICATION
NA

15. EST. TEST TIME
24 HOURS

16. SUPPORT REQUIREMENTS
GN_2
GHE
SPARE PARTS
SPECIAL TOOLS AS REQUIRED
CLEANING EQUIPMENT
FUNCTIONAL TEST EQUIPMENT
ENVIRONMENTALLY CONTROLLED AREA

17. OTHER APPLICABLE REFERENCE DOCUMENTATION
6-BLGSEV-3996

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF RELIEF VALVE, NASA P/N B10437799-1, 2, 3, STEWART-WARNER CORP. P/N 117B1300-1, -2, -3

2. KSC TEST NUMBER
V-30270

3. EFFECTIVITY
GSE

4. TEST OBJECTIVES

To maintain, repair and functionally test the following valve:

NASA P/N	VENDOR P/N
B10437799-1, 2, 3	117B1300-1, -2, -3

5. TEST DESCRIPTION/EQUIPMENT STATUS/CONFIGURATION

THIS TEST ☒ DOES ☐ DOES NOT CONTAIN HAZARDOUS OPERATIONS. It is classed a standby.

Prime test organization is Mechanical Systems Laboratory.

Test Parts are - Disassembly
Inspection
Cleaning
Lubrication
Reassembly
Functional Test
Packaging

Test Requirements NA

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
A	5-3-68	MERGER CHANGES VENDOR NAME FROM CORNELIUS CO. CORRECT VENDOR P/N	J.A. Etling	Donald Scoville

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
F. L. Kutch	BATC 5-8534	11/14/67
10. NASA-KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
D. A. Scoville	LV-MEC-1	11/16/67

KSC FORM 23-338 (7/67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF RELIEF VALVE, NASA P/N B10437799-1, 2, 3, STEWART-WARNER CORP. P/N 117B1300-1, -2, -3

2. KSC TEST NUMBER
V-30270

3. EFFECTIVITY
GSE

13. LOCATION
VAB 1K11

14. COMPUTER PROC. INDENTIFICATION
NA

15. EST. TEST TIME
24 hours

16. SUPPORT REQUIREMENTS

GN2
GHe
Spare Parts
Special tools as required
Cleaning requirement
Functional test equipment
Environmental controlled area

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

6-BLGSEV-3533

18. ITEM CONTINUATION

727

REV 32

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1 TEST TITLE
MAINTENANCE AND REPAIR OF DOUBLE ACTING PNEUMATIC CYLINDER, NASA P/N 75M06911, PNEUDRAULICS, INC., P/N 7091

2 KSC TEST NUMBER
V-30274

3 EFFECTIVITY
GSE

4 TEST OBJECTIVES
To maintain, repair and functionally test the following cylinder:

NASA P/N	VENDOR P/N
75M06911	7091

5 TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST XX DOES DOES NOT CONTAIN HAZARDOUS OPERATIONS. It is classed a standby.

Prime test organization is Mechanical Systems Laboratory.

Test Parts are - Disassembly
Inspection
Cleaning
Lubrication
Reassembly
Functional Test
Packaging

Phase NA — NA

CANCELLED

REV	DATE	REASON	Contractor Approval	KSC Approval
A	5-30-74	Cancelled - 501 & 502 Only	J. O. Baggett 5/31/74	5/31/74

7 ORIGINATOR	8 ORGANIZATION	9. DATE
[illegible]	BATC 5-8534	11/14/67
[illegible] Scoville	LV-MEC-1	12 APPROVAL DATE 11/16/67

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1 TEST TITLE
MAINTENANCE AND REPAIR OF DOUBLE ACTING PNEUMATIC CYLINDER, NASA P/N 75M06911, PNEUDRAULICS, INC., P/N 7091

2 KSC TEST NUMBER
V-30274

3 EFFECTIVITY
GSE

13 LOCATION	14 COMPUTER PROC. IDENTIFICATION	15 EST. TEST TIME
VAB 1K11	NA	24 hours

16 SUPPORT REQUIREMENTS

GN2
GHe
Spare Parts
Special tools as required
Cleaning requirement
Functional test equipment
Environmental controlled area

17 OTHER APPLICABLE REFERENCE DOCUMENTATION

6-BLGSEV-4027

18 ITEM CONTINUATION

CANCELLED

228

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF NASA P/N 75M05869, LBFV-3,-7,-9,-10 -11,-12,-13,-24; 75M14522, LBFV-3,-13 CRYOGENIC HANDLING BUTTERFLY VALVE, B. H. HADLEY, INC.

2. KSC TEST NUMBER
V-30314

3. EFFECTIVITY
GSE

4. TEST OBJECTIVES

TO MAINTAIN, REPAIR AND FUNCTIONALLY TEST THE VALVE.

5. TEST DESCRIPTION/EQUIPMENT STATUS/CONFIGURATION

THIS TEST [X] DOES [ ] DOES NOT *CONTAIN HAZARDOUS OPERATIONS.* IT IS CLASSED A STANDBY.

PRIME TEST ORGANIZATION IS MECHANICAL SYSTEMS LABORATORY.

TEST PARTS ARE - DISASSEMBLY
INSPECTION
CLEANING
LUBRICATION
REASSEMBLY
FUNCTIONAL TEST
PACKAGING

TEST REQUIREMENTS
NA

6. REV.	DATE	REASON FROM TITLE.	Contractor Approval	KSC Approval
A	7-26-68	ADD ADDITIONAL VALVES LBFV-7,-10,-12,-24 AND NASA P/N 75M14522 LBFV-3,-13. DELETE VENDOR P/N	J. A. Etling 7/26/68	7/31/67

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
F. L. KUTCH	BATC 5-8534	NOVEMBER 13, 1967
10. NASA-KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
D. A. SCOVILLE	LV-MEC-1	11/16/67

KSC FORM 23 338 (7/67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF NASA P/N 75M05869 LBFV-3,-7,-9,-10, -11,-12,-13,-24; 75M14522 LBFV-3, -13 CRYOGENIC HANDLING BUTTERFLY VALVE, B. H. HADLEY, INC.

2. KSC TEST NUMBER
V-30314

3. EFFECTIVITY
GSE

13. LOCATION
VAB 1K11

14. COMPUTER PROC. INDENTIFICATION
NA

15. EST. TEST TIME
24 HOURS

16. SUPPORT REQUIREMENTS

GN_2
GHE
SPARE PARTS
SPECIAL TOOLS AS REQUIRED
CLEANING EQUIPMENT
FUNCTIONAL TEST EQUIPMENT
ENVIRONMENTALLY CONTROLLED AREA

17. OTHER APPLICABLE REFERENCE DOCUMENTATION
6-BLGSEV-4008

18. ITEM CONTINUATION

REV 32

KSC OPERATIONS APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET	PAGE 1 OF 2
1. TEST TITLE MAINTENANCE AND REPAIR OF VALVE, MANUALLY OPERATED ANGLE 6000 psig PNEUMATIC SYSTEM, AUTOCLAVE ENGINEERING COMPANY, P/N 20-7163, NASA P/N 75M05871 PAV-1, -3; 75M13208 PAV-1,-3	2. KSC TEST NUMBER V-30361 3. EFFECTIVITY AS REQUIRED

4. TEST OBJECTIVES

To maintain, repair and functionally test the following valve:

NASA P/N	Vendor P/N
75M-05871-PAV-1, -3 75M13208 PAV-1, -3	20-7163

5. TEST DESCRIPTION/EQUIPMENT STATUS/CONFIGURATION

THIS TEST [X] DOES [ ] DOES NOT *CONTAIN HAZARDOUS OPERATIONS.* It is classed a standby.

Prime test organization is Mechanical Systems Laboratory.

Test parts are - Disassembly
Inspection
Cleaning
Lubrication
Reassembly
Functional Test
Packaging

Test Requirements

NA

CANCELLED

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
B	5-30-4	Cancel - Requirement Deleted.	[signature] 5/30/74	[signature]
A	8-16-68	ADD PAD B COMP. 75M13208 PAV-1,-3 CHANGE EFFECTIVITY.	[signature]	[signature]

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
[signature] F.L. Kutch	BATC 5-8534	11/15/67
10. NASA-KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
[signature] D.A. Scoville	LV-MEC-1	11/16/67

KSC FORM 23-338 (7/67)

230

389

9 KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF VALVE, GASEOUS NITROGEN SYSTEM. CALMEC MAFG CO., P/N C-188-B1, NASA P/N 75M51352

2. KSC TEST NUMBER
V-30362

3. EFFECTIVITY
GSE

4. TEST OBJECTIVES

To maintain, repair and functionally test the following valve:

NASA PN	Vendor PN
75M51352	C-188-B1

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST XX *DOES* __ *DOES NOT CONTAIN HAZARDOUS OPERATIONS.* It is classed a standby

Prime test organization is Mechanical Systems Laboratory

Test parts are - Disassembly
Inspection
Cleaning
Lubrication
Reassembly
Functional Test
Packaging

Test Requirements

NA

6. REV.	DATE	REASON	Contractor Approval	KSC Approval

7. CONTRACTOR APPROVAL
F.L. Rutch

8. ORGANIZATION
BATC 5-8534

DATE
11/15/67

13. NASA KSC APPROVAL
D. Coville

11. ORGANIZATION
LV-MEC-1

12. APPROVAL DATE
11/16/67

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF VALVE, GASEOUS NITROGEN SYSTEM, CALMEC MEG. CO., P/N C-188-B1, NASA P/N 75M51352

2. KSC TEST NUMBER
V-30362

3. EFFECTIVITY
GSE

13. LOCATION
VAB 1K 11

14. COMPUTER PROC. INDENTIFICATION
NA

15. EST. TEST TIME
24 hours

16. SUPPORT REQUIREMENTS

GN2
GHe
Spare Parts
Special tools as required
Cleaning requirement
Functional test equipment
Environmentally controlled area

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

6- BLGSEV-3516

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF PUMP, FIXED DISPLACEMENT, COMMERICAL SHEARING & STAMPING CO., P/N P15H300BEYR10-16
NASA P/N 75M06350-1

2. KSC TEST NUMBER
V-30369

3. EFFECTIVITY
GSE

4. TEST OBJECTIVES

To maintain, repair and functionally test the following pump:

NASA P/N	Vendor P/N
75M06350-1	P15H300BEYR10-16

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST XX DOES ( ) DOES NOT CONTAIN HAZARDOUS OPERATIONS. It is classed a standby

Prime test organization is Mechanical Systems Laboratory

Test parts are -- Disassembly
Inspection
Cleaning
Lubrication
Reassembly
Functional Test
Packaging

Test Requirements

NA

6. REV	DATE	REASON	Contractor Approval	KSC Approval

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
F.E. Kutch	BATC 5-8534	11/15/67
10. NASA APPROVAL D.A. Scoville	11. ORGANIZATION LV-NEG-1	12. APPROVAL DATE 11/16/67

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF PUMP, FIXED DISPLACEMENT, COMMERCIAL SHEARING & STAMPING CO., P/N P15H300BEYR10-16
NASA P/N 75M06350-1

2. KSC TEST NUMBER
V-30369

3. EFFECTIVITY
GSE

13. LOCATION	14. COMPUTER PROG. INDENTIFICATION	15. EST. TEST TIME
VAB 1K 11	NA	24 hours

16. SUPPORT REQUIREMENTS

GN2
GHe
Spare parts
Special tools as required
Cleaning requirement
Functional test equipment
Encironmentally controlled area

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

6-BLGSEV-3529

18. ITEM CONTINUATION

232

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF LOX PNEUMATIC SYSTEM, REPUBLIC MFG. CO., 81933 Series, P/N 52CL8193B-6AS2 NASA P/N 75M05868

2. KSC TEST NUMBER
V-30375

3. EFFECTIVITY
GSE

4. TEST OBJECTIVES

To maintain, repair and functionally test the following pneumatic system:

NASA P/N	VENDOR P/N
75M05868	52CL8193B-6AS2

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST XX DOES ☐ DOES NOT CONTAIN HAZARDOUS OPERATIONS. It is classed a standby.

Prime test organization is Mechanical Systems Laboratory.

Test parts are
Disassembly
Inspection
Cleaning
Lubrication
Reassembly
Functional Test
Packaging

Test Requirements

NA

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
A	4-9-68	TO CORRECT PART NUMBER	J.A. Ethington Nov 12 '68	

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
F.L. Rueb	BATC 5-8534	11/15/67
10. NASA KSC APPROVAL D.A. Scoville	11. ORGANIZATION LV-MEC-1	12. APPROVAL DATE 11/16/67

KSC FORM 21-[illegible]

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF LOX PNEUMATIC SYSTEM, REPUBLIC MFG. CO., 6193B SERIES, P/N 52CL8193B-6AS2 NASA P/N 75M05868

2. KSC TEST NUMBER
V-30375

3. EFFECTIVITY
GSE

12. LOCATION
VAB 1K 11

14. COMPUTER PROC. INDENTIFICATION
NA

15. EST. TEST TIME
24 hours

16. SUPPORT REQUIREMENTS

GN2
GHe
Spare parts
Special tools as required
Cleaning requirement
Functional test equipment
Environmentally controlled area

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

6-BLGSEV-3967

18. ITEM CONTINUATION

233

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF VALVE, CHECK, 4" AND 6" HORIZONTAL SWING, FUEL SYSTEM, POWELL ENGINEERING COMPANY, SERIES 2433 SS NASA P/N 75M05867 FCV-2, -3 ; 75M14888 FCV-2, -3

2. KSC TEST NUMBER
V-30383

3. EFFECTIVITY
AS REQUIRED

4. TEST OBJECTIVES

To maintain, repair and functionally test the following valve:

NASA P/N	VENDOR P/N
75M05867 FCV-2, -3	2433 SS
75M14888 FCV-2, -3	

5. TEST DESCRIPTION EQUIPMENT STATUS/CONFIGURATION

THIS TEST [X] DOES [ ] DOES NOT CONTAIN HAZARDOUS OPERATIONS. It is classed a standby.

Prime test organization is Mechanical Systems Laboratory.

Test Parts are - Disassembly
Inspection
Cleaning
Lubrication
Reassembly
Functional Test
Packaging

Test Requirements N/A

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
A	8-21-68	ADD PAD B COMPONENT 75M14888 FCV-2, -3 CHANGE EFFECTIVITY	J. S. Elling	Da Scoville

7. CONTRACTOR APPROVAL	8. ORGANIZATION	DATE
F. L. Kutch	BATC 5-8534	11/15/67
9. NASA/KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
D. A. Scoville	LV-MEC-1	11/16/67

KSC FORM 23 336 (7 67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF VALVE, CHECK, 4" AND 6" HORIZONTAL SWING, FUEL SYSTEM, POWELL ENGINEERING COMPANY, SERIES 2433 SS NASA P/N 75M05867 FCV-2, -3; 75,14888 FCV-2, -3

2. KSC TEST NUMBER
V-30383

3. EFFECTIVITY
AS REQUIRED

13. LOCATION	14. COMPUTER PROG. INDENTIFICATION	15. EST TEST TIME
VAB 1K 11	NA	24 hours

16. SUPPORT REQUIREMENTS

GN2
GHe
Spare Parts
Special tools as required
Cleaning requirement
Functional test equipment
Environmental controlled area

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

6-BLGSEV-3632

18. ITEM CONTINUATION

234

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1 TEST TITLE
MAINTENANCE AND REPAIR OF VALVE, CHECK, HYDRAULIC, 3000 PSI HYDRAULIC SYSTEM, REPUBLIC MANUFACTURING COMPANY, MODEL NUMBER 458-32SS, NASA P/N 75M09007

2 KSC TEST NUMBER
V-30387

3 EFFECTIVITY
GSE

6 TEST OBJECTIVES

To maintain, repair and functionally test the following valve:

NASA P/N	VENDOR P/N
75M09007	458-32SS

5 TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST XX DOES ___ DOES NOT CONTAIN HAZARDOUS OPERATIONS. It is classed a standby.

Prime test organization is Mechanical Systems Laboratory.

Test Parts are - Disassembly
Inspection
Cleaning
Lubrication
Reassembly
Functional Test
Packaging

Test Requirements NA

4 REV.	DATE	REA	Contractor Approval	KSC Appr.

	8 ORGANIZA	9. DATE
[illegible]	BATC S-[illegible]	11/15/67
[illegible]	11 ORGANIZATION	12. APPROVAL DATE
D. A. [illegible]	LV-MEC-1	11/16/67

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE [illegible] 2

1 TEST TITLE
MAINTENANCE AND REPAIR OF VALVE, CHECK, HYDRAULIC, 3000 PSI HYDRAULIC SYSTEM, REPUBLIC MANUFACTURING COMPANY, MODEL NUMBER 458-32SS, NASA P/N 75M09007

2 KSC TEST NUMBER
V-30387

3 EFFECTIVITY
GSE

13 LOCATION
VAB 1K 11

14 COMPUTER PROG. IDENTIFICATION
NA

15 EST. TEST TIME
24 hours

16 SUPPORT REQUIREMENTS

GN2
GHe
Spare Parts
Special tools as required
Cleaning requirement
Functional test equipment
Environmental controlled area

17 OTHER APPLICABLE REFERENCE DOCUMENTATION

6-BLGSEV-3637

18 ITEM CONTINUATION

235

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF VALVE, 1/2" MANUAL NEEDLE, RP-1
SYSTEM, DRAGON ENGINEERING CO, MODEL 816
NASA P/N 75M05867 FNV-3, 75M14888 FNV-3

2. KSC TEST NUMBER
V-30393

3. EFFECTIVITY
AS REQUIRED

4. TEST OBJECTIVES

To maintain, repair and functionally test the following valve:

NASA P/N	VENDOR P/N
75M05867 FNV-3	Model 816
75M14888 FNV-3	

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST [X] DOES [ ] DOES NOT CONTAIN HAZARDOUS OPERATIONS. It is classed a standby

Prime test organization is Mechanical Systems Laboratory.

Test parts are - Disassembly
Inspection
Cleaning
Lubrication
Reassembly
Functional Test
Packaging

Test Requirements

NA

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
A	10-8-68	ADD PAD B COMPONENT 75M14888 FNV-3, CHANGE VENDOR P/N, EFFECTIVITY AND VALVE SIZE.	J.A. Etling	D.A. Scoville

7. CONTRACTOR APPROVAL	8. ORGANIZATION	DATE
F.L. Kutch	BATC 5-8534	11/15/67
10. NASA-KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
D.A. Scoville	LV-MEC-1	11/16/67

KSC FORM 23 338 (7-67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF VALVE, 1/2" MANUAL NEEDLE, RP-1
SYSTEM, DRAGON ENGINEERING CO., MODEL 816
NASA P/N 75M-5867 FNV-3, 75M14888 FNV-3

2. KSC TEST NUMBER
V-30393

3. EFFECTIVITY
AS REQUIRED

13. LOCATION	14. COMPUTER PROC. INDENTIFICATION	15. EST TEST TIME
VAB 1K 11	NA	24 hours

16. SUPPORT REQUIREMENTS

GN2
GHe
Spare parts
Special tools as required
Cleaning requirement
Functional test equipment
Environmentally controlled area

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

6-BLGSEV-3539-A

18. ITEM CONTINUATION

236

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF PUMP, LOX 1000 GPM, LIQUID OXYGEN SYSTEM, BYRON-JACKSON PUMPS, INC. P/N 1E-2779 , NASA P/N 75M05869 LPM-6

2. KSC TEST NUMBER
V-30404

3. EFFECTIVITY
GSE

4. TEST OBJECTIVES

To maintain, repair, and functionally test the following pump:

NASA P/N	VENDOR P/N
75M05869 LPM-6	1E-2779

5. TEST DESCRIPTION/EQUIPMENT STATUS/CONFIGURATION

THIS TEST [X] DOES [ ] DOES NOT *CONTAIN HAZARDOUS OPERATIONS.* It is classed a standby.

Prime test organization is Mechanical Systems Laboratory.

Test Parts are - Disassembly
Inspection
Cleaning
Lubrication
Reassembly
Functional Test
Packaging

Phase NA

Test Requirements NA

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
A	12/14/70	TO CORRECT NASA P/N & REFERENCE DOCUMENTATION	R H Adams	12/17/70

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
F. J. Kutch	BATC 5-8534	11/15/67
10. NASA-KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
D.A. Scoville	LV-MEC-1	11/16/67

KSC FORM 23-338 (7/67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF PUMP, LOX 1000 GPM, LIQUID OXYGEN SYSTEM, BYRON-JACKSON PUMPS, INC. NASA P/N 75M05869 LPM-6

2. KSC TEST NUMBER
V-30404

3. EFFECTIVITY
GSE

13. LOCATION
VAB 1K11

14. COMPUTER PROC. INDENTIFICATION
NA

15. EST. TEST TIME
24 hours

16. SUPPORT REQUIREMENTS

GN2
GHE
Spare Parts
Special Tools as required
Cleaning requirement
Functional Test equipment
Environmental controlled area

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

V-30478
V-30046

18. ITEM CONTINUATION

237

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF VALVE, CHECK, 1/2 INCH,
VACCO VALVE COMPANY, P/N CVT-3P-463P
NASA P/N 75M05752 HCV-12

2. KSC TEST NUMBER
V-30412

3. EFFECTIVITY
GSE

4. TEST OBJECTIVES

To maintain, repair and functionally test the following check valve:

NASA P/N	VENDOR P/N
75M05752 HCV-12	CVT-3P-463P

5. TEST DESCRIPTION EQUIPMENT STATUS/CONFIGURATION

THIS TEST XX DOES ☐ DOES NOT CONTAIN HAZARDOUS OPERATIONS. It is classed a standby.

Prime test organization is Mechanical Systems Laboratory.

Test Parts are - Disassembly
Inspection
Cleaning
Lubrication
Reassembly
Functional Test
Packaging

Test Requirements NA

6. REVISION LETTER	REASON	Contractor Approval	KSC Approval

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
[signature]	BATC 5-8534	11/15/67
10. KSC APPROVAL [signature] W. H. Scoville	11. ORGANIZATION LV-NSC-1	12. APPROVAL DATE 11/16/67

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF VALVE, CHECK, 1/2 INCH,
VACCO VALVE COMPANY, P/N CVT-3P-463P
NASA P/N 75M05752 HCV-12

2. KSC TEST NUMBER
V-30412

3. EFFECTIVITY
GSE

12. LOCATION: VAB 1K11

14. COMPUTER PROG. IDENTIFICATION: NA

18. EST. TEST TIME: 24 hours

16. SUPPORT REQUIREMENTS

GN2
Glie
Spare Parts
Special tools as required
Cleaning requirement
Functional test equipment
Environmental controlled area

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

6-BLGSEV-3855-A

19. ITEM CONTINUATION

238

440

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF CHECK VALVE, PNEUMATIC, HYDRO-PNEUMATIC SYSTEM, JAMES, POND, AND CLARK, INC., P/N 299T1-SERIES, NASA P/N 10430233

2. KSC TEST NUMBER
V-30416

3. EFFECTIVITY
GSE

4. TEST OBJECTIVES
To maintain, repair, and functionally test the following valve.

NASA P/N	VENDOR P/N
10430233	299T1-SERIES

5. TEST DESCRIPTION EQUIPMENT STATUS/CONFIGURATION

THIS TEST [X] DOES [ ] DOES NOT CONTAIN HAZARDOUS OPERATIONS. It is classed a standby.

Prime test organization is Mechanical Systems Laboratory.

Test parts are - Disassembly
Inspection
Cleaning
Lubrication
Reassembly
Functional Test
Packaging

Test Requirements

NA

6. REV. DATE	REVISION	Contractor Approval	KSC Approval
7. CONTRACTOR APPROVAL	8. ORGANIZATION BATC 5-8534	9. DATE 11/15/67	
10. [illegible]	11. ORGANIZATION LV-MMC-1	12. APPROVAL DATE 11/16/67	

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF CHECK VALVE, PNEUMATIC, HYDRO-PNEUMATIC SYSTEM, JAMES, POND, AND CLARK, INC., P/N 299T1-SERIES, NASA P/N 10430233

2. KSC TEST NUMBER
V-30416

3. EFFECTIVITY
GSE

13. LOCATION
VAB 1K11

14. COMPUTER PROC. INDENTIFICATION
NA

15. EST. TEST TIME
24 hours

16. SUPPORT REQUIREMENTS

GN_2
GHe
Spare Parts
Special tools as required
Cleaning requirement
Functional test equipment
Environmental controlled area

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

6-BLGSEV-3794

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE

MAINTENANCE AND REPAIR OF VALVE, PNEUMATIC SYSTEM, TWO WAY METERING 6000 PSI, MAROTTA VALVE CORPORATION, P/N 227934, MODEL SPV29AA, NASA P/N 75M51272

2. KSC TEST NUMBER
V-30419

3. EFFECTIVITY
GSE

4. TEST OBJECTIVES

To maintain, repair, and functionally test the following valve.

NASA P/N	VENDOR P/N
75M51272	227934, MODEL SPV29AA

5. TEST DESCRIPTION/EQUIPMENT STATUS/CONFIGURATION

THIS TEST [X] DOES [ ] DOES NOT *CONTAIN HAZARDOUS OPERATIONS.* It is classed a standby.

Prime test organization is Mechanical Systems Laboratory.

Test parts are - Disassembly
Inspection
Cleaning
Lubrication
Reassembly
Functional Test
Packaging

Phase NA

Test Requirements

NA

CANCELLED

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
A	5-30-4	Cancel - Requirement deleted.	R.H. Rance 5/30/74	

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
T. L. Kutch	BATC 5-8534	11/15/67
10. NASA KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
D. A. Scoville	LV-MEC-1	11/16/67

KSC FORM 23-336 (7/67)

705

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF REGULATOR, PRESSURE, NASA P/N 75M51364, 75M51383, 75M05871-PPRV-5 TESCOM CORPORATION, SERIES 26-1000

2. KSC TEST NUMBER
V-30438

3. EFFECTIVITY
GSE

4. TEST OBJECTIVES

To describe the maintenance, repair and functional testing of the following regulator:

NASA P/N	VENDOR P/N
75M51383	SERIES 26-1000

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST [X] DOES [ ] DOES NOT CONTAIN HAZARDOUS OPERATIONS. It is classed a standby

Prime test organization is Mechanical Systems Laboratory

Test Parts are: Disassembly
Inspection
Cleaning
Lubrication
Reassembly
Functional Test
Packaging

Test Requirements

NA

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
A	4-9-68	COMBINED V-30136 AND V-30167 TO FORM A SERIES	J. A. Ethington	Jesse L. Leach

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
F. L. Kutch	BATC 5-8534	11/15/67
10. NASA/KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
D. A. Scoville	LV-MEC-1	11/16/67

KSC F

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF REGULATOR, PRESSURE, NASA P/N 75M51364, 75M51383, 75M05871-PPRV-5 TESCOM CORPORATION, SERIES 26-1000

2. KSC TEST NUMBER
V-30438

3. EFFECTIVITY
GSE

13. LOCATION
VAB 1K11

14. COMPUTER PROC. INDENTIFICATION
NA

15. EST. TEST TIME
24 Hours

16. SUPPORT REQUIREMENTS

GN2
GHe
Spare Parts
Special Tools as required
Cleaning Equipment
Functional Test Equipment
Environmentally Controlled Area

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

6-BLGSEV-3990, 3741, 3661

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF NASA P/N 75M12665-1
ACCUMULATOR, SWING ARM SYSTEMS
AMERICAN BOSCH ARMA CORPORATION, P/N EHS41-591

2. KSC TEST NUMBER
V-30446

3. EFFECTIVITY
GSE

4. TEST OBJECTIVES
TO MAINTAIN, REPAIR AND FUNCTIONALLY TEST THE ACCUMULATOR.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST [X] DOES [ ] DOES NOT *CONTAIN HAZARDOUS OPERATIONS.* IT IS CLASSED A STANDBY.

PRIME TEST ORGANIZATION IS MECHANICAL SYSTEMS LABORATORY.

TEST PARTS ARE - DISASSEMBLY
INSPECTION
CLEANING
LUBRICATION
REASSEMBLY
FUNCTIONAL TEST
PACKAGING

TEST REQUIREMENTS
NA

6. REV.	DATE	ASON	Contractor Approval	KSC Approval

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
E. KUTCH	BATC 5-8534	NOVEMBER 15, 1967
10. KSC APPROVAL D. A. SCOVILLE	11. ORGANIZATION LV-MEC-1	12. APPROVAL DATE 11/16/67

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF NASA P/N 75M126665-1
ACCUMULATOR, SWING ARM SYSTEMS
AMERICAN BOSCH ARMA CORPORATION P/N EHS41-591

2. KSC TEST NUMBER
V-30446

3. EFFECTIVITY
GSE

13. LOCATION	14. COMPUTER PROC. INDENTIFICATION	18. EST. TEST TIME
VAB 1K11	NA	24 HOURS

16. SUPPORT REQUIREMENTS

GN_2
GH_E
SPARE PARTS
SPECIAL TOOLS AS REQUIRED
CLEANING EQUIPMENT
FUNCTIONAL TEST EQUIPMENT
ENVIRONMENTALLY CONTROLLED AREA

17. OTHER APPLICABLE REFERENCE DOCUMENTATION
6-BLGSEV-3897

18. ITEM CONTINUATION

242

REV 32

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF NASA P/N 75M13285-2, -4
SOLENOID VALVE, MAROTTA VALVE CORPORATION
P/N 229634-2, MODEL MV-130V

2. KSC TEST NUMBER
V-30452

3. EFFECTIVITY
GSE

4. TEST OBJECTIVES

MAINTENANCE, REPAIR AND FUNCTIONAL TESTING OF THE VALVE.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST X *DOES* ☐ *DOES NOT* *CONTAIN HAZARDOUS OPERATIONS.* IT IS CLASSED A STANDBY.

PRIME TEST ORGANIZATION IS MECHANICAL SYSTEMS LABORATORY.

TEST PARTS ARE - DISASSEMBLY
- INSPECTION
- CLEANING
- LUBRICATION
- REASSEMBLY
- FUNCTIONAL TEST
- PACKAGING

TEST REQUIREMENTS
NA

CANCELED

REV.	DATE	REASON	Contractor Approval	KSC Approval
B	5/31/72	DUPLICATE TO PROC V-30237 CANCELLED PER LVO REQUEST	[signature]	[signature]
A	1/20/69	To incorporate Rev. C of 75M13285	[signature]	[signature]

7. CONTRACTOR APPROVAL [signature] F. C. KOTCH	8. ORGANIZATION BATC 5-8534	9. DATE NOVEMBER 15, 1967
10. NASA-KSC APPROVAL [signature] D. A. SCOVILLE	11. ORGANIZATION LV-MEC-1	12. APPROVAL DATE 11/16/67

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF NASA P/N 75M13285-2, -4
SOLENOID VALVE, MAROTTA VALVE CORPORATION
P/N 229634-2, MODEL MV-130V

2. KSC TEST NUMBER
V-30452

3. EFFECTIVITY
GSE

13. LOCATION	14. COMPUTER PROC. INDENTIFICATION	15. EST. TEST TIME
VAB 1K11	NA	24 HOURS

16. SUPPORT REQUIREMENTS

GN_2
GHE
TEST PARTS
SPECIAL TOOLS AS REQUIRED
CLEANING EQUIPMENT
FUNCTIONAL TEST EQUIPMENT
ENVIRONMENTALLY CONTROLLED AREA

17. OTHER APPLICABLE REFERENCE DOCUMENTATION
6-BLGSEV-3916

18. ITEM CONTINUATION

CANCELED

243

478

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF NASA P/N 75M08814-1, -2
HYDRAULIC ACCUMULATOR, SERVICE ARM SYSTEM
AMERICAN BOSCH ARMA CORPORATION, P/N EHS41-414, -415

2. KSC TEST NUMBER
V-30454

3. EFFECTIVITY
GSE

4. TEST OBJECTIVES

TO MAINTAIN, REPAIR AND FUNCTIONALLY TEST THE ACCUMULATOR.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST [X] DOES [ ] DOES NOT *CONTAIN HAZARDOUS OPERATIONS.* IT IS CLASSED A STANDBY.

PRIME TEST ORGANIZATION IS MECHANICAL SYSTEMS LABORATORY.

TEST PARTS ARE - DISASSEMBLY
INSPECTION
CLEANING
LUBRICATION
REASSEMBLY
FUNCTIONAL TEST
PACKAGING

TEST REQUIREMENTS
NA

6. REV.	DATE	REASON	Contractor Approval	KSC Approval

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
F. L. KUTCH	BATC 5-8534	NOVEMBER 15, 1967
10. KSC APPROVAL W. A. SCOVILLE	11. ORGANIZATION LV-MEC-1	12. APPROVAL DATE 11/16/67

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF NASA P/N 75M08814-1, -2
HYDRAULIC ACCUMULATOR, SERVICE ARM SYSTEM
AMERICAN BOSCH ARMA CORPORATION P/N EHS41-414, -415

2. KSC TEST NUMBER
V-30454

3. EFFECTIVITY
GSE

13. LOCATION
VAB 1K11

14. COMPUTER PROC. INDENTIFICATION
NA

15. EST. TEST TIME
24 HOURS

16. SUPPORT REQUIREMENTS

GN_2
GHE
SPARE PARTS
SPECIAL TOOLS AS REQUIRED
CLEANING EQUIPMENT
FUNCTIONAL TEST EQUIPMENT
ENVIRONMENTALLY CONTROLLED AREA

17. OTHER APPLICABLE REFERENCE DOCUMENTATION
6-BLGSEV-3919

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF NASA P/N 75M09046
ACCUMULATOR ASSEMBLY, AMERICAN BOSH ARMA CORPORATION
P/N EHS41-413

2. KSC TEST NUMBER
V-30455

3. EFFECTIVITY
GSE

4. TEST OBJECTIVES

TO MAINTAIN, REPAIR AND FUNCTIONALLY TEST THE ACCUMULATOR.

5. TEST DESCRIPTION/EQUIPMENT STATUS/CONFIGURATION

THIS TEST [X] DOES [ ] DOES NOT CONTAIN HAZARDOUS OPERATIONS. IT IS CLASSED A STANDBY.

PRIME TEST ORGANIZATION IS MECHANICAL SYSTEMS LABORATORY.

TEST PARTS ARE - DISASSEMBLY
INSPECTION
CLEANING
LUBRICATION
REASSEMBLY
FUNCTIONAL TEST
PACKAGING

TEST REQUIREMENTS
NA

6. REV.	DATE	REASON	Contractor Approval	KSC Approval

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
F. L. KUTCH	BATC 5-8534	NOVEMBER 15, 1967
10. NASA KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
D. A. SCOVILLE	LV-MEC-1	11/16/67

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF NASA P/N 75M09046
ACCUMULATOR ASSEMBLY, AMERICAN BOSH ARMA CORPORATION
P/N EHS41-413

2. KSC TEST NUMBER
V-30455

3. EFFECTIVITY
GSE

13. LOCATION
VAB 1K11

14. COMPUTER PROC. INDENTIFICATION
NA

18. EST. TEST TIME
24 HOURS

16. SUPPORT REQUIREMENTS

GN_2
GHE
SPARE PARTS
SPECIAL TOOLS AS REQUIRED
CLEANING EQUIPMENT
FUNCTIONAL TEST EQUIPMENT
ENVIRONMENTALLY CONTROLLED AREA

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

6-BLGSEV-3920

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF 75M11877, FILTER
AIRCRAFT POROUS MEDIA, P/N ACM 3105-410AX2

2. KSC TEST NUMBER
V-30490

3. EFFECTIVITY
GSE

4. TEST OBJECTIVES

TO MAINTAIN, REPAIR AND FUNCTIONALLY TEST THE FOLLOWING FILTER

NASA P/N	VENDOR P/N
75M11877	ACM3105-410AX2

5. TEST DESCRIPTION/EQUIPMENT STATUS/CONFIGURATION

THIS TEST [X] DOES [ ] DOES NOT CONTAIN HAZARDOUS OPERATIONS. IT IS CLASSED A STANDBY.

PRIME TEST ORGANIZATION IS MECHANICAL SYSTEMS LABORATORY.

TEST PARTS ARE - DISASSEMBLY
INSPECTION
CLEANING
LUBRICATION
REASSEMBLY
FUNCTIONAL TEST
PACKAGING

TEST REQUIREMENTS
NA

6. REV.	DATE	REASON	Contractor Approval	KSC Approval

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
F. L. KUTCH	BATC 5-8534	11/7/67 NOVEMBER 7, 1967
10. NASA KSC APPROVAL D. A. SCOVILLE	11. ORGANIZATION LV-MEC-1	12. APPROVAL DATE 11/27/67

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF 75M11877, FILTER
AIRCRAFT POROUS MEDIA, P/N ACM3105-410AXE

2. KSC TEST NUMBER
V-30490

3. EFFECTIVITY
GSE

13. LOCATION
VAB 1K11

14. COMPUTER PROC. INDENTIFICATION
NA

15. EST. TEST TIME
24 HOURS

16. SUPPORT REQUIREMENTS

GN_2
GH_E
SPARE PARTS
SPECIAL TOOLS AS REQUIRED
CLEANING REQUIREMENT
FUNCTIONAL TEST EQUIPMENT
ENVIRONMENTALLY CONTROLLED AREA

17. OTHER APPLICABLE REFERENCE DOCUMENTATION
NONE

18. ITEM CONTINUATION

-46

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF MANIFOLD ASSEMBLY, ANDERSON GREENWOOD & CO., P/N M6AVS-4, NASA P/N 75M04676 NMAB-1

2. KSC TEST NUMBER
V-30510

3. EFFECTIVITY
As required

4. TEST OBJECTIVES

To maintain, repair and functionally test the following manifold assembly:

NASA P/N	Vendor P/N
75M04676 NMAB-1	M6AVS-4

5. TEST DESCRIPTION/EQUIPMENT STATUS/CONFIGURATION

THIS TEST [XX] DOES [ ] DOES NOT *CONTAIN HAZARDOUS OPERATIONS.* It is classed a standby.

Prime test organization is Mechanical Systems Laboratory.

Test parts are: Disassembly
Inspection
Cleaning
Lubrication
Reassembly
Functional Test
Packaging

Test Requirements NA

6. REV.	DATE	REASON	Contractor Approval	KSC Approval

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
F.L. Kutch	DATC 5-8534	11/28/69
10. NASA-KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
D.A. Scoville	LV-MEC-1	6 Dec 69

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
MAINTENANCE AND REPAIR OF MANIFOLD ASSEMBLY, ANDERSON GREENWOOD & CO., P/N M6AVS-4, NASA P/N 75M04676 NMAB-1

2. KSC TEST NUMBER

3. EFFECTIVITY
As required

13. LOCATION	14. COMPUTER PROC. INDENTIFICATION	15. EST. TEST TIME
VAB 1K 11	NA	24 hours

16. SUPPORT REQUIREMENTS

GN2
GHe
Spare parts
Special tools as required
Functional test equipment
Cleaning requirement
Environmental controlled area

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

6-BLGSEV-3893

18. ITEM CONTINUATION

247

REV 32

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

KSC TEST NUMBER: V-31011

EFFECTIVITY: AS-206 & SUBS; AS-512 & SUBS

IU UMBILICAL CABLE INSTALLATION

[illegible] GUIDELINES FOR PROPERLY CONNECTING UMBILICAL CABLES TO THE UMBILICAL HEAD AND VERIFYING GROUND STRAP CONNECTIONS.

THIS TEST ___ DOES X DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

[illegible] HEAD WILL BE MATED TO VEHICLE PRIOR TO CONNECTION OF [illegible] CABLES. IU GROUND POWER WILL BE OFF DURING UMBILICAL CONNECTION. UMBILICAL CABLES WILL BE UNCAPPED AND SCREWED [illegible] UMBILICAL HEAD ASSEMBLY. ALSO CONNECT AND VERIFY GROUND STRAP CONNECTIONS.

CONFIGURATION: IU MUST BE STACKED.

PHASE: II,III,IV

TEST REQUIREMENTS
MSFC:
TM-011-001-2H
13.1m1.1.1

REV.	DATE	REASON	Contractor Approval	KSC Approval
[illegible]	[illegible]	REVISE MSFC REQUIREMENTS	[signature]	[signature]
[illegible]	[illegible]	REVISED BLOCKS 18	[signature]	[signature]
[illegible]	3/[illegible]/72	REVISE BLOCKS 3, 8, 13, 16 AND 17	[signature] 3/7/72	[signature]
		[illegible] effectivity from AS-[illegible] & Subs [illegible]	[signature] 5-8-[illegible]	[signature]
[illegible]	[illegible]	UPDATED PHASE AND DELETED MSFC REQUIREMENTS.	[signature] 2/20/68	[signature]

[illegible]	ORGANIZATION: K73	9. DATE: 22 SEPTEMBER 1967
JAMES K. DAVIDSON	ORGANIZATION: LV-GDC-25	12. APPROVAL DATE: 17 OCTOBER 1967

APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

1. TEST TITLE: IU UMBILICAL CABLE INSTALLATION

V-31011

AS-206 & SUBS; AS-512 & SUBS

13. LOCATION: VAB/LC-39A, B

14. COMPUTER [illegible]: N/A

4 HOURS

16. SUPPORT REQUIREMENTS

INTERSTAGE: NONE

OFF-COMPLEX: NONE

ON-COMPLEX: IBM QUALITY
IBM MECHANICAL
IBM VEHICLE NETWORKS

17. OTHER APPLICABLE REFERENCE DOCUMENTS

SEE BLOCK 18, BELOW

18. ITEM CONTINUATION

REFERENCE DOCUMENTATION

	512 & SUBS	206 & SUBS
CABLE INSTALLATION DWG	40M12378	40M07806
AESS CID	79091XX	79105XX
FORWARD SERVICE ARM	75M08723	75M08723
HOUSING ASSEMBLY DWG	11200001-1	11200004-1
IU CABLE INSTALLATION SPECS.	7907387	7907387

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
GSCU POWER UP/DOWN

2. KSC TEST NUMBER
V-31108

3. EFFECTIVITY
AS-209 & SUBS

4. TEST OBJECTIVES

TO BRING THE GSCU & FCVB UP TO AN OPERATING CONDITION USING GROUND POWER OR POWER SUPPLIES.

TO POWER DOWN THE GSCU & FCVB USING GROUND POWER OR POWER SUPPLIES.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST [ ] DOES [X] DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

THE GSCU(S) ARE LOCALLY OPERATED TO VERIFY PRESSURES, FLOWS AND TEMPERATURES ARE WITHIN LIMITS. IF THE GSCU(S) ARE TO BE REMOTELY OPERATED, CONTROLS ARE POSITIONED FOR REMOTE OPERATION. ADDITIONAL OPERATIONS FOR SET-UP OF OTHER EQUIPMENT IS INCLUDED WHEN GETTING READY FOR STAGE POWER.

SECURING STEPS POSITION CONTROLS SUCH THAT THE GSCU(S) ARE IN A STANDBY CONFIGURATION.

CONFIGURATION: INSTALLED ON LUT

PHASE: II, III, IV, V, VI

TEST REQUIREMENTS

MSFC:
0.3.5.2.3.2
0.3.5.2.3.4

REV.	DATE	REASON	Contractor Approval	KSC Approval
C	[illegible]-71	REVISED BLOCKS 3, 4 & 17	[illegible]	[illegible]
B	[illegible]-71	REVISED BLOCKS 3, 4, AND 5	[illegible]	[illegible]
B	5/7/71	CHANGE BLOCKS 3, 5, 13, 16 & 17	S/G.LECKIE 5/6/71	S/P.SCHMID
A	3/5/71	CHANGE PREFIX FORM "IV" TO "V" AND BLOCK 15	S/G.LECKIE	S/P.SCHMID

7. INITIAL APPROVAL	8. ORGANIZATION	9. DATE
S/W.B. HOTT	IBM - K73	4 OCTOBER 1967
11. NASA APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
S/PAUL W. SCHMID	JD-25	10-9-67

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
GSCU POWER UP/DOWN

2. KSC TEST NUMBER
V-31108

3. EFFECTIVITY
AS-209 & SUBS

13. LOCATION
LC 39

14. COMPUTER PROC. INDENTIFICATION
N/A

15. EST. TEST TIME
1 MAN - 1.5 HRS. TOTAL

16. SUPPORT REQUIREMENTS

INTERSTAGE: NONE

OFF-COMPLEX: NONE

ON-COMPLEX: IBM QUALITY ASSURANCE
IBM MECHANICAL
FACILITY 440 VAC

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

MSFC-MAN-008
V-36038

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
LUT NETWORKS JUMPER/SIMULATOR INSTALLATION AND REMOVAL

2. KSC TEST NUMBER
V-31109

3. EFFECTIVITY
GSE

4. TEST OBJECTIVES

TO PROVIDE A UNIFORM METHOD TO IDENTIFY, INSTALL, CHECKOUT AND REMOVE FUSED TEST JUMPERS AND SIMULATORS FOR LUT ELECTRICAL NETWORKS SUPPORT OF LCC INTEGRATION TESTING.

5. TEST DESCRIPTION/EQUIPMENT STATUS/CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

THIS PROCEDURE WILL:

A. IDENTIFY FUSED TEST JUMPERS AS TO FUSE SIZE, PATCH RACKS AND JACK/PIN REQUIREMENTS. INSTALL AND CHECK FOR CONTINUITY AND INDICATE APPROPRIATE TIME FOR REMOVAL OF JUMPERS.

B. IDENTIFY SPECIFIC REQUIREMENTS FOR INSTALLING SIMULATORS/ BREAKOUT BOXES AND THEIR REMOVAL.

6. REV.	DATE	REASON	Contractor Approval	KSC Approval

7. CONCURRENCE APPROVAL

	8. ORGANIZATION	9. DATE
ev [signature]	BATC 5-8513	8/30/71
AL [signature] eet	11. ORGANIZATION LV-GDC-24	12. APPROVAL DATE 8/30/71

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
LUT NETWORKS JUMPER/SIMULATOR INSTALLATION AND REMOVAL

2. KSC TEST NUMBER
V-31109

3. EFFECTIVITY
GSE

13. LOCATION	14. COMPUTER PROC. INDENTIFICATION	15. EST. TEST TIME
ML	NA	ONE HOUR

16. SUPPORT REQUIREMENTS

NA

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

18. ITEM CONTINUATION

250

REV 32

185

KSC OPERATIONS APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET	PAGE 1 OF 2
1. TEST TITLE: SIB STAGE, ESE AND LSE ELECTRICAL PREPARATIONS AND POST TEST OPERATIONS FOR BACKUP GUIDANCE SIMULATION FLIGHT TEST AND FRT	2. KSC TEST NUMBER: V-31133
	3. EFFECTIVITY: 206 & Subs

4. TEST OBJECTIVES

TO CONFIGURE THE SIB STAGE, ESE, LSE ELECTRICAL AND PERFORM POST TEST OPERATIONS IN SUPPORT OF BACKUP GUIDANCE SIMULATION FLIGHT TEST AND FLIGHT READINESS TEST.

5. TEST DESCRIPTION, EQUIPMENT STATUS CONFIGURATION

THIS TEST ___ DOES [X] DOES NOT CONTAIN HAZARDOUS OPERATIONS.

Section A - Test Requirements

Section B - Preparations

Prepares the SIB Stage, ESE, and LSE Electrical for BUGS and FRT.

Section C - Securing

Performs those steps necessary for securing the SIB Stage, ESE, and LSE Electrical from FRT.

A. SEV.	DATE	REASON	Contractor Approval	KSC Approval
A	2-5-73	Changes TCP Format		

7. INITIATOR OF APPROVAL	8. ORGANIZATION	9. DATE
W. C. Brown	CCSD	9-22-72
10. APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
R.W.Richie for R.P.Clay C.E.Overstreet	LV-GDC-24 LV-GDC-22	9-22-72

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)	PAGE 2 OF 2
1. TEST TITLE: SIB STAGE, ESE, AND LSE ELECTRICAL PREPARATIONS AND POST TEST OPERATIONS FOR BACKUP GUIDANCE SIMULATION FLIGHT TEST AND FRT.	2. KSC TEST NUMBER: V-31133
	3. EFFECTIVITY: 206 & Subs
13. LOCATION: LC-39	14. COMPUTER PROG. INDENTIFICATION: N/A
	15. EST. TEST TIME: 4 Days

16. SUPPORT REQUIREMENTS

Skylab KPRD 20002
Skylab KPRD 21006

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

V-20120 - SV Flight Readiness Test
V-20119 - LV Backup Guidance Simulation Flight Test

18. ITEM CONTINUATION

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2) | PAGE 2 OF 2

1. TEST TITLE: CERTIFICATION OF S-IB HYDRAULIC SERVICER

2. KSC TEST NUMBER: V-33037

3. EFFECTIVITY: 206 & Subs

12. LOCATION: F.C. Lab

14. COMPUTER PROG. IDENTIFICATION: N/A

15. EST. TEST TIME: 1.0 Hour

16. SPECIAL REMARKS

NONE

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

NONE

18. ITEM CONTINUATION

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KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE: CERTIFICATION OF S-IB HYDRAULIC SERVICER

2. KSC TEST NUMBER: V-33037

3. EFFECTIVITY: 206 & Subs

4. TEST OBJECTIVES

TO VERIFY THAT THE S-IB HYDRAULIC SERVICER IS FUNCTIONALLY OPERATIVE PRIOR TO ITS USE IN FLIGHT CONTROL LABORATORY CHECKOUT.

5. TEST DESCRIPTION/EQUIPMENT STATUS/CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

1. The unit is visually inspected for any physical damage or major hydraulic leaks.

2. The unit is activated and the test actuators are stroked, using the portable substitute computer, to verify proper system operation.

CONFIGURATION: LABORATORY TEST.

TEST REQUIREMENTS:
MSFC - N/A

A	6-28-72	Effectivity Change per TI-2-17, Rev. F		
4. REV.	DATE	REASON	Contractor Approval	KSC Approval

7. INITIATOR APPROVAL	8. ORGANIZATION	9. DATE
D. Stewart/W. O. Brown	CCSD	10-6-71
10. NASA-KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
George W. Ely	LV-GDC-33	10/20/71

KSC FORM 4-119 (7/69)

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REV 32

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1 TEST TITLE
S-IB FLIGHT CONTROL PRE-OPERATIONAL AND SECURING PROCEDURE

2 KSC TEST NUMBER
V-33038

3 EFFECTIVITY
206 & SUBS

4 TEST OBJECTIVES

PREPARE S-IB FLIGHT CONTRO L HYDRAULIC & RECORDING SYSTEM (S) FOR OPERATION.

SECURE S-IB FLIGHT CONTROL HYDRAULIC AND RECORDER SYSTEM (S).

5 DESCRIPTION (EQUIPMENT STATUS CONFIGURATION

THIS TEST DOES X DOES NOT CONTAIN HAZARDOUS OPERATIONS.

1. Visual inspection of hydraulic actuators and associated hardware.
2. Prepare hydraulic System(s) for operation.
3. Stabilize the Flight Control recorders, calibrate, set sensitivity and speed.
4. Prepare display and control console for hydraulic system (s) control and monitoring.
5. Secure hydraulic system (s) actuators, flight control recorders, and display and control console.

CONFIGURATION: Vehicle in vertical position.

TEST REQUIREMENTS:
MSFC - N/A

6 REVISION EFFECTIVITY

REF. DATE	REASON	Contractor Approval	KSC Approval

7 CONTRACTOR APPROVAL 6/13
A. Petro W. O. Brown

8. ORGANIZATION
CCSD

9. DATE
10-V-71

10 NASA-KSC APPROVAL 10-20-71
Henry W. Ely 10/20/71

11. ORGANIZATION
LV-GDC-33

12. APPROVAL DATE
10/20/71

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1 TEST TITLE
S-IB FLIGHT CONTROL PRE-OPERATIONALD AND SECURING PROCEDURE

2 KSC TEST NUMBER
V-33038

3 EFFECTIVITY
206& SUBS

13 LOCATION LC-39 FR#3, HB-1

14 COMPUTER PROG. IDENTIFICATION
N/A

15 EST. TEST TIME
1.0 Hour

16 SUPPORT REQUIREMENTS

1. Ground power
2. S-IB Stage Power
3. LCC Measuring
4. DDAS
5. RCA-110A
6. S-IB Vehicle Mechanical

17 OTHER APPLICABLE REFERENCE DOCUMENTATION

NONE

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

S-IB FLIGHT CONTROL SYSTEM PREPARATIONS AND SECURING OPERATIONS FOR OVERALL TESTS

KSC TEST NUMBER: V-33039

EFFECTIVITY: 206 & SUBS

VERIFY PREPARATIONS AND SECURING OPERATIONS FOR VEHICLE SYSTEMS OVERALL TESTS ARE COMPLETE.

THIS TEST [ ] DOES X DOES NOT CONTAIN HAZARDOUS OPERATIONS.

1. VERIFY ALL CABLING AND CONNECTIONS TO HYDRAULIC ACTUATORS AND SUBASSEMBLIES.
2. PREPARE S-IB HYDRAULIC ACTUATOR SYSTEMS FOR OPERATION.
3. CALIBRATE AND READY THE FLIGHT CONTROL RECORDERS FOR OPERATION.
4. PREPARE THE DISPLAY CONTROL CONSOLE FOR OPERATION.
5. SECURE HYDRAULIC SYSTEMS ACTUATORS, FLIGHT CONTROL RECORDERS AND THE DISPLAY CONTROL CONSOLE.

CONFIGURATION: VEHICLE IN VERTICAL POSITION.

TEST REQUIREMENTS:
MSFC - N/A

REV.	DATE	REASON	Contractor Approval	KSC Approval
				H. W. Ely

7. CONTRACTOR APPROVAL: D. Stewart, W. O. Brown	8. ORGANIZATION: CCSD	9. DATE: 10-X-71
10. NASA/KSC APPROVAL: Henry W. Ely 10/20/71	11. ORGANIZATION: LV-GDC-33	12. APPROVAL DATE: 10/20/71

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE: S-IB FLIGHT CONTROL SYSTEM PREPARATIONS AND SECURING OPERATIONS FOR OVERALL TESTS

2. KSC TEST NUMBER: V-33039

3. EFFECTIVITY: 206 & SUBS

13. LOCATION: LC-39

14. COMPUTER PROG. IDENTIFICATION: N/A

15. EST. TEST TIME: 1.0 Hour

16. SUPPORT REQUIREMENTS

1. Ground Power
2. S-IB Stage Power
3. IU Power
4. LCC Measuring
5. DDAS
6. S-IB Vehicle Mechanical

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

NONE

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
S-IC STAGE ACTUATOR LOCKS REMOVAL AND INSTALLATION

2. KSC TEST NUMBER
V-33053

3. EFFECTIVITY
503 and Subs

4. TEST OBJECTIVES

To perform locks removal or installation of the S-IC Stage Actuator Locks using manual methods

5. TEST DESCRIPTION EQUIPMENT STATUS/CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT CONTAIN HAZARDOUS OPERATIONS. It is classed a subtask.

Prime test organization is S-IC Stage.

Instructions shall be provided for removal and installation of S-IC stage servoactuator locks using manual engine actuators or manpower. Provisions shall be made for performing locks installation or removal with thermal insulation boots and bellows installed or not installed.

Test Requirements

MSFC: NA

6. REV.	DATE	REASON	Contractor Approval	KSC Approval

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
W.E.Estes/C.W.Tucker	BATC 5-8521/5-8531	11/29/67
10. NASA APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
R. Newall	LV-MEC-23	12-1-7

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
S-IC STAGE ACTUATOR LOCKS REMOVAL AND INSTALLATION

2. KSC TEST NUMBER
V-33053

3. EFFECTIVITY
503 and Subs

13. LOCATION	14. COMPUTER PROC. INDENTIFICATION	15. EST. TEST TIME
VAB, Pad	NA	4 hours

16. SUPPORT REQUIREMENTS

Engine servicing platform

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

18. ITEM CONTINUATION

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REV B2

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
MECHANICAL SYSTEMS SUPPORT OF IU STAGE POWER

2. KSC TEST NUMBER
V-34017

3. EFFECTIVITY
AS-206 & SUBS

4. TEST OBJECTIVES
PROVIDES SEQUENCED STEPS TO APPLY IU MECHANICAL SYSTEM POWER MANUALLY OR PER LOA1. OPERATES THE IU COOLING SYSTEM WITH MANUAL OR LAM1 CONTROL. GAS BEARING SUPPLY SYSTEM MAY ALSO BE OPERATED MANUALLY OR UNDER CONTROL OF LAM1. FUNCTIONAL TESTING MAY BE PERFORMED UNDER CONTROL OF LAM2.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT CONTAIN HAZARDOUS OPERATIONS.

THIS TEST IS DIVIDED INTO FOUR PARTS:

PART I: NORMAL SUPPORT (LA01, LAM1, LAM2)
PART II: SYSTEMS MONITORING
PART III: MANUAL OPERATIONS
PART IV: EMERGENCY STEPS

CONFIGURATION: VEHICLE STACKED, UMBILICAL CONNECTED

PHASE: III, IV, V, VI

TEST REQUIREMENTS

MSFC: 7921601
0.3.5.1.1.2 ✓
0.3.5.2.0 ✓
0.3.5.2.2.1.1 ✓
0.3.5.2.3.1 ✓
0.3.5.2.4.1 ✓
0.3.5.2.4.3 ✓
0.3.5.2.4.4 ✓
0.3.5.2.7.1.1 ✓
0.3.5.5.2 ✓
TM-011-001-2H
B.1.7.1.2 ✓
B.3.0.1.G ✓
B.14.0.4.1.1 ✓
B.1.7.1.1 ✓

6 REV.	DATE	REASON	Contractor Approval	KSC Approval
E	8-6-4	REVISED BLOCKS 3, 4, 5, 14 AND 17	O R Riley	Roland
D	4-19-2	REVISED BLOCKS 3, 5, 16 & 17	G.E. LECKIE	P. SCHMID
C	12-20-1	REVISE MSFC REQUIREMENTS	G.E. LECKIE	P. SCHMID
B	9-10-1	REVISE MSFC REQUIREMENTS, RETITLE PARTS I - IV	W.B. HUNT	P. SCHMID
A	1-8-70	REVISE MSFC REQUIREMENTS	J.C. PEURRUNG	P. SCHMID

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
S/J.C. PEURRUNG	IBM - K73	AUGUST 28, 1969
10. NASA KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
S/P.W. SCHMID	LV-MEC-25	AUGUST 28, 1969

KSC FORM 28 310 7-67

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
MECHANICAL SYSTEMS SUPPORT OF IU STAGE POWER

2. KSC TEST NUMBER
V-34017

3. EFFECTIVITY
AS-206 & SUBS

13. LOCATION
VAB, LC39A, B, C

14. COMPUTER PROC. INDENTIFICATION
LAM1, LAM2, LA01

15. EST. TEST TIME
2 MEN - 8 HOURS

16. SUPPORT REQUIREMENTS

INTERSTAGE: NONE

OFF-COMPLEX: NONE

ON-COMPLEX: OIS
HIGH PRESSURE GAS (6000 PSI)
750 PSI GN2
IU QUALITY ASSURANCE
IBM MECHANICAL

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

MSFC-MAN-014	20Z42212	V-31108
MSFC-MAN-008	V-21223	7921601
MSFC-MAN-036	V-36038	TM-011-001-2H

18. ITEM CONTINUATION

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KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
INSTALLATION AND REMOVAL, LOX TANK SUMP, DSV-4B STAGE

2. KSC TEST NUMBER
V-34030

3. EFFECTIVITY
As Required

4. TEST OBJECTIVES
THE OBJECT OF THIS PROCEDURE IS TO INSURE THAT THE LO_2 TANK SUMP AND ANTI-VORTEX SCREEN ASSEMBLY INSTALLATION AND/OR REMOVAL IS ACCOMPLISHED IN THE PROPER SEQUENCE AND UNDER SPECIFIED CLEAN CONDITIONS.

5. TEST DESCRIPTION EQUIPMENT STATUS/CONFIGURATION

THIS TEST [X] DOES [ ] DOES NOT CONTAIN HAZARDOUS OPERATIONS.

SPECIFIES THE PROCEDURE TO BE USED TO INSTALL AND/OR REMOVE THE LIQUID OXYGEN TANK SUMP AND THE ANTI-VORTEX OXIDIZER SCREEN AND DIFFUSER ASSEMBLY. PROCEDURE ENSURES THAT SYSTEM CLEANLINESS IS MAINTAINED.

THIS PROCEDURE MAY BE ACCOMPLISHED IN EITHER THE VAB LOW BAY, VAB HIGH BAY, OR AT THE LAUNCH PAD.

THE STAGE MAY BE IN EITHER THE VERTICAL OR HORIZONTAL POSITION. LOX AND LH_2 TANKS MUST BE VENTED TO AMBIENT. X-RAY PORTION MUST BE PERFORMED WITH STAGE IN VERTICAL POSITION AFTER FINAL ERECTION.

TEST REQUIREMENTS:

MSFC TR N/A

REV.	DATE	REASON	Contractor Approval	KSC Approval
C	10-20-71	CHANGE RD NUMBER	R.O. Emplaincourt	B Stephenson
B	10-08-71	REVISED BLOCK 17 REVISED KSC TEST NO. V-34030, WAS O-IV-34030	R.O. Emplaincourt	B Stephenson
A	9-17-71	CHANGE RD NUMBER AND DELETED PHASE CALLOUT AND MSFC TR NUMBERS	M.K. Bowe	B Stephenson

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
/S/ F. W. MUELLER FOR M. J. PLUMER	DOUGLAS	11-20-7
10. KSC/KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
/S/W. J. MAHONEY	LV-MEC-24	11-27-7

KSC FORM 23-336 (7/67)

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APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
INSTALLATION AND REMOVAL, LOX TANK SUMP, DSV-4B STAGE

2. KSC TEST NUMBER
V-34030

3. EFFECTIVITY
As Required

13. LOCATION
VAB, LC 39

14. COMPUTER PROC. IDENTIFICATION
N/A

15. EST. TEST TIME
8 Hours

16. SUPPORT REQUIREMENTS

SID-34030-D
40090-2V

17. OTHER APPLICABLE REFERENCE DOCUMENTATION
DAC DRAWING 1B57687
DAC DRAWING 1B62406.

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
IU LIGHT COMPONENT INSTALLATION & REMOVAL

2. KSC TEST NUMBER
V-34045

3. EFFECTIVITY
SL-206 & SUBS
AS-512 & SUBS

4. TEST OBJECTIVES

TO INSTALL OR REMOVE COMPONENTS IN THE INSTRUMENT UNIT.

5. TEST DESCRIPTION/EQUIPMENT STATUS/CONFIGURATION

THIS TEST [ ] DOES [X] DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

LIGHT COMPONENTS ARE HAND CARRIED INTO THE IU (USING HARNESS OR TRANSPORTER BAG) POSITIONED, AND MOUNTING HARDWARE IS INSTALLED AND TORQUED. REMOVAL IS ACCOMPLISHED BY REVERSING PROCEDURE FOR INSTALLING.

CONFIGURATION: VEHICLE EITHER STACKED OR IU DEMATED IN RECEIVING AREA.

PHASE: II, III, IV, V, VI

TEST REQUIREMENTS

206 AND SUBS	512 AND SUBS
MSFC: 7921601	MSFC: 7916404
0.3.3.1.1	0.3.3.1.1

6 REV.	DATE	REASON	Contractor Approval	KSC Approval
C	4/19/72	REVISED BLOCKS 3, 5, 16 & 17	G. E. Lecke 4/20/72	
B	6-4-71	CHANGED PREFIX FROM "IV" TO "V"	G. E. Lecke 6/4/71	
A	1/7/70	REVISED MSFC REQUIREMENTS - BLOCKS 5 & 17	J. C. Severns 1-13-70	

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
S/W. B. HUNT	IBM - 906	OCTOBER 2, 1967
10. NASA/KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
S/ P. W. SCHMID	JD-25	OCTOBER 6, 1967

KSC FORM 23-338 (7-67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
IU LIGHT COMPONENT INSTALLATION & REMOVAL

2. KSC TEST NUMBER
V-34045

3. EFFECTIVITY
SL-206 & SUBS
512 & SUBS

13. LOCATION
LC 39A, B, C

14. COMPUTER PROC. INDENTIFICATION
N/A

15. EST. TEST TIME

16. SUPPORT REQUIREMENTS

INTERSTAGE REQUIREMENTS: N/A

OFF-COMPLEX SUPPORT: N/A

ON-COMPLEX SUPPORT: IBM QUALITY ASSURANCE
IU VEHICLE ELECTRICAL NETWORKS
IBM MECHANICAL

17. OTHER APPLICABLE REFERENCE DOCUMENTATION
10Z22501 (SAT V) 7921601
7916404
10Z22204 (SAT IB)

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
IU ACCESS DOOR INSTALLATION & REMOVAL

2. KSC TEST NUMBER
V-34046

3. EFFECTIVITY
AS-206 & SUBS

4. TEST OBJECTIVE
TO INSTALL OR REMOVE THE INSTRUMENT UNIT ACCESS DOOR.

5. CONFIGURATION EQUIPMENT STATUS EXPLANATION
THIS TEST X DOES ___ DOES NOT CONTAIN HAZARDOUS OPERATIONS.

THIS SUB TASK IS DIVIDED INTO TWO PARTS:

A. THE ACCESS DOOR IS INSTALLED BY POSITIONING IT IN THE OPENING AND UPPER AND LOWER SPLICE PLATES ARE INSTALLED. THE DOOR HANDLES ARE REMOVED AND LEFT AND RIGHT SIDE SPLICE PLATES ARE INSTALLED, THEN ATTACHING HARDWARE IS TORQUED. DOOR/SEGMENT SPLICE PLATE IS INSPECTED FOR STRESS CORROSION PRIOR TO AND FOLLOWING INSTALLATION.

B. THE DOOR IS REMOVED BY REVERSING THE SEQUENCE FOR INSTALLATION.

CONFIGURATION: VEHICLE STACKED OR IU IN STORAGE AREA.

PHASE: II, V, VI

TEST REQUIREMENTS

MSFC: 7921601
0.3.3.1.1
0.3.3.2.1.1

REV	DATE	REASON	Contractor Approval	KSC Approval
F	8-8-67	REVISED BLOCKS 3, 5 AND 17	D.K. Riley	[signature]
E	3-20-67	REVISE BLOCK 5	D.K. RILEY	P. SCHMID
D	2-8-67	REVISE HAZARDOUS LEVEL	G.E. LECKIE	P. SCHMID
C	12-13-66	REVISED BLOCKS 3, 5, 16 & 17	G.E. LECKIE	P. SCHMID
B	9-14-66	CHANGE CONFIG FROM "A" TO "V"	G.E. LECKIE	P. SCHMID
A	5-27-66	CHANGE MSFC REQUIREMENTS	J.C. PEURRUNG	P. SCHMID

6. PREPARED BY	7. ORGANIZATION	9. DATE	
D.W. HOLT	IBM - K73	29 SEPTEMBER 1967	
8. APPROVED BY	10. ORGANIZATION	12. APPROVAL DATE	
[illegible]	JD - 25	10 OCTOBER 1967	

APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET 2

1. TEST TITLE
IU ACCESS DOOR INSTALLATION & REMOVAL

2. KSC TEST NUMBER
V-34046

3. EFFECTIVITY
AS-206 & SUBS

13. LOCATION
MLC 39A, B, C

14. COMPUTER PROGRAM IDENTIFICATION
N/A

15. TEST TIME
2 MEN - 1 HOUR

16. SUPPORT REQUIREMENTS

INTERSTAGE REQUIREMENTS: N/A

OFF-COMPLEX SUPPORT: N/A

ON-COMPLEX SUPPORT: IBM QUAL ASSURANCE
IBM MECHANICAL

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

30Z13109 7910574 30Z13112
30Z13104 7921601

18. ITEM CONTINUATION

REV 32

KSC OPERATION
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
IU HEAVY COMPONENT INSTALLATION AND REMOVAL

2. KSC TEST NUMBER
V-34047

3. EFFECTIVITY
AS-206 & SUBS

4. TEST OBJECTIVES

1. TO INSTALL OR REMOVE THE FOLLOWING COMPONENTS:

LVDA, LVDC, ST-124 PLATFORM, FCC, BATTERIES, POWER DISTRIBUTOR, PLATFORM ELECTRONIC ASSY.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT CONTAIN HAZARDOUS OPERATIONS.

COMPONENTS ARE TRANSPORTED TO THE IU ON THEIR HANDLING FIXTURES. COOLANT CAVITIES OF INDIVIDUALLY COOLED COMPONENTS ARE FILLED WITH COOLANT FROM THE GSCU (IF THE IU TCS IS IN CLOSED LOOP CONFIGURATION) AND TRANSFERED TO THE COMPONENT HANDLING EQUIPMENT HOIST IN THE IU. THE COMPONENT IS POSITIONED AND MOUNTING HARDWARE IS INSTALLED AND TORQUED. ADDITIONAL CONNECTIONS ARE COMPLETED, AND THE HOIST IS REMOVED FROM THE IU.

REMOVAL IS ACCOMPLISHED BY REVERSING THE PROCEDURE.

CONFIGURATION: VEHICLE STACKED.

PHASE: III, IV, V, VI

TEST REQUIREMENTS

MSFC: 7921601
0.3.3.1.1
0.3.5.2.6.1.4

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
I	8/09/4	REVISED BLOCKS 3, 4, 5 & 17	J.K. Ridley	P. Schmid
H	6/13/73	REVISE MSFC REQUIREMENTS	G.E. LECKIE	P. SCHMID
G	4/13/72	REVISED BLOCKS 3, 4, 5, 16 & 17	G.E. LECKIE	P. SCHMID
F	8/16/71	REVISE MSFC REQUIREMENTS	G.E. LECKIE	P. SCHMID
E	6/4/71	CHANGE PREFIX FROM "IV" TO "V"	G.E. LECKIE	P. SCHMID
D	12/3/70	REVISE MSFC REQUIREMENT REF RSCC 53	D.E. SCHMIDT	P. SCHMID
C	1/7/70	REVISE EFFECTIVITY & BLOCK 5	J.C. PEURRUNG	P. SCHMID
B	11/24/9	CHANGE BLOCK 4	J.C. PEURRUNG	P. SCHMID
A	1/19/8	UPDATE BLOCKS 4 AND 17	S/J. HANSEN	S/P. SCHMID

7. PREPARATION APPROVAL
S/W.B. HUNT

8. ORGANIZATION
IBM - 906

9. DATE
29 SEPTEMBER 1967

10. NASA/KSC APPROVAL
S/P.W. SCHMID

11. ORGANIZATION
JD-25

12. APPROVAL DATE
6 OCTOBER 1967

KSC FORM 8-100 (REV)

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
IU HEAVY COMPONENT INSTALLATION AND REMOVAL

2. KSC TEST NUMBER
V-34047

3. EFFECTIVITY
AS-206 & SUBS

13. LOCATION
LC 39A, B, C

14. COMPUTER PROC. INDENTIFICATION
N/A

15. EST. TEST TIME
4 MEN - 16 HOURS

16. SUPPORT REQUIREMENTS

INTERSTAGE REQUIREMENTS: N/A

OFF-COMPLEX SUPPORT: N/A

ON-COMPLEX SUPPORT: Q/A
IBM MECHANICAL
IBM IU VEHICLE NETWORKS
IBM QUAL. ASSURANCE

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

MSFC-MAN-008	V-31108
MSFC-SPEC-164	7921601
MSFC-SPEC-195	

18. ITEM CONTINUATION

REV 32

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KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
ACTUATOR HOLDING FIXTURE - INSTALLATION & REMOVAL

2. KSC TEST NUMBER
V-34048

3. EFFECTIVITY
As Required

4. TEST OBJECTIVES

Specifies the instructions for installing and removing the actuator holding fixture. The holding fixture provides the means for supporting the actuators, holds the engine at center and allows the actuator to be cycled full stroke and not move engine.

5. TEST DESCRIPTION/EQUIPMENT STATUS/CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT CONTAIN HAZARDOUS OPERATIONS.

Test Description
Holding Fixture Installation:

1. Removes engine struts from area of pitch actuator.
2. Disconnects pitch & yaw actuators from attach points.
3. Installs holding fixture
4. Attach actuators to holding fixtures

Holding Fixture Removal:

1. Detaches actuator from the holding fixture
2. Removes holding fixture
3. Installs actuator to the flight configuration
4. Reinstalls engine struts to the flight configuration

Equipment Status
1. Aft Interstage Access installed
   DSV-4B-474 Fixture, Engine Actuator Support Kit

Test Configuration
1. The stage shall be vertical.

STANDBY

TEST REQUIREMENTS
MSFC: None

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
B	3/8/71	Revised KSC Test No. V-30348, was O-IV-34048	R.A. English 3/9/71	
A	3/25/69	Change Effectivity to "As Req'd". Holding Fixture Instl. no longer req'd during normal test sequence.		

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
M. J. Plomer/s	DAC/FTC	10/2/67
10. NASA-KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
W. G. Mahoney/s	LV-MEC-24	10/20/67

KSC FORM 23-378 (7-67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
ACTUATOR HOLDING FIXTURE, INSTALLATION & REMOVAL

2. KSC TEST NUMBER
V-34048

3. EFFECTIVITY
As Required

13. LOCATION
LC 34/37, VAB

14. COMPUTER PROC. INDENTIFICATION
N/A

15. EST. TEST TIME
8 Hrs

16. SUPPORT REQUIREMENTS

Rocketdyne personnel

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

T1-61632 Actuator Holding Fixture, Instl. & Removal

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
PREPARATION FOR USE OF GEARCASE PRESSURE, CONTROL SYSTEM PRESSURE, AND HYDRAULIC PRECHARGE PRESSURE MONITOR GAGES

2. KSC TEST NUMBER
V-34052

3. EFFECTIVITY
206 AND SUBS

4. TEST OBJECTIVES

1) CHECKOUT CONTROL SPHERE HIGH PRESSURE MONITOR GAGE. (0-3000 PSIG)
2) CHECKOUT 750 PSIG CONTROL PRESSURE MONITOR GAGE.
3) CHECKOUT GEARCASE PRESSURE MONITOR GAGES (0-15 PSIG, 8 EACH)
4) CHECKOUT HYDRAULIC PRECHARGE MONITOR GAGE. (0-3000 PSIG)

5. TEST DESCRIPTION/EQUIPMENT STATUS/CONFIGURATION

THIS TEST [X] DOES [ ] DOES NOT CONTAIN HAZARDOUS OPERATIONS.

THE PNEUMATIC TEST PANELS AND MONITOR GAGES ARE SET UP IN A SAFE, CONVENIENT LOCATION ON THE LAUNCH PEDESTAL.

1) A 0-3000 PSIG PNEUMATIC TEST PANEL (LOX SERVICE) IS CONNECTED TO THE 0-3000 PSIG GAGE IN THE CONTROL SYSTEM PRESSURE MONITOR PANEL. TEST PANEL AND MONITOR GAGE INCREASING AND DECREASING PRESSURE IS RECORDED IN 500 PSI INCREMENTS (0-3000 PSIG) THE CONTROL SPHERE MONITOR GAGE MUST READ WITHIN 25 PSIG OF THE CALIBRATED GAGE. THE TEST SETUP IS SECURED AS REQUIRED, AND ALL LINES AND FITTINGS SEALED TO MAINTAIN CLEANLINESS. THE MONITOR GAGE IS THEN READY FOR USE.

2) A 0-1000 PSIG PNEUMATIC TEST PANEL (LOX SERVICE) IS CONNECTED TO THE 0-800 PSIG GAGE IN THE CONTROL SYSTEM MONITOR PANEL. TEST PANEL AND MONITOR GAGE INCREASING AND DECREASING PRESSURES ARE RECORDED IN 100 PSI INCREMENTS. (0-800 PSIG) THE 750 PSIG CONTROL PRESSURE MONITOR GAGE MUST READ WITHIN 10 PSIG OF THE CALIBRATED GAGE. THE TEST SETUP IS DISMANTLED AS REQUIRED, AND ALL LINES AND FITTINGS SEALED TO MAINTAIN CLEANLINESS. THE MONITOR GAGE IS THEN READY FOR USE.

3) A 0-25 PSIG PNEUMATIC TEST PANEL (FUEL SERVICE) IS CONNECTED TO THE 0-15 PSIG GEARCASE PRESSURE MONITOR GAGES. TEST PANEL AND MONITOR GAGE INCREASING AND DECREASING PRESSURE IS RECORDED IN 2 PSI INCREMENTS (0-15 PSIG). MONITOR GAGES ARE REDLINES AT 2 AND 10 PSIG. THE TEST SETUP IS DISMANTLED AS REQUIRED. ALL LINES AND FITTINGS ARE SEALED TO MAINTAIN CLEANLINESS. THE MONITOR GAGE IS THEN READY FOR USE.

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
B.	7/21/72	CLASSIFIED HAZARDOUS BY SYSTEMS SAFETY	J. Yamasaki	R Newell
A	2/28/72	NON-HAZARDOUS PER KMI.1710.13A/SF	A. Osanto	R Newell

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
	CCSD	9/22/71
10. NASA KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
R Newell	LV MEC 23	10/28/71

KSC FORM 23-338 (12/67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
PREPARATION FOR USE OF GEARCASE PRESSURE, CONTROL SYSTEM PRESSURE, AND HYDRAULIC PRECHARGE PRESSURE MONITOR GAGES

2. KSC TEST NUMBER
V-34052

3. EFFECTIVITY
206 AND SUBS

13. LOCATION
VAB

14. COMPUTER PROC. INDENTIFICATION
N/A

15. EST. TEST TIME
4 HOURS

16. SUPPORT REQUIREMENTS

H. P. GAS

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

NONE

18. ITEM CONTINUATION

ITEM #5 .
VEHICLE CONFIGURATION - N/A

TEST REQUIREMENTS
MSFC: N/A

PHASE N/A

ITEM #5

4) A 0-3000 PSIG PNEUMATIC TEST PANEL (FUEL SERVICE) IS CONNECTED TO THE HYDRAULIC PRECHARGE MONITOR GAGE. TEST PANEL AND MONITOR GAGE INCREASING AND DECREASING PRESSURES ARE RECORDED IN 500 PSI INCREMENTS. THE HYDRAULIC PRECHARGE MONITOR GAGE IS MARKED FOR EASY IDENTIFICATION. THE TEST SETUP IS DISMANTLED AS REQUIR AND ALL LINES AND FITTINGS SEALED TO MAINTAIN CLEANLINESS. THE MONITOR GAGE IS THEN READY FOR USE.

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REV 32

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1 TEST TITLE
MODEL VI GROUND HYDRAULIC SERVICER FUNCTIONAL CHECKOUT AND PREPARATION TEST. (STAND BY)

2 MSC TEST NUMBER
V-34053

3 EFFECTIVITY
AS REQUIRED

4 TEST OBJECTIVES

1) FUNCTIONAL CHECKOUT OF THE GROUND HYDRAULIC SERVICER.
2) ENSURE CLEANLINESS OF HYDRAULIC FLUID IN THE GROUND HYDRAULIC SERVICER.
3) CHECK GROUND HYDRAULIC SERVICER FOR LEAKS.

5 DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST DOES X DOES NOT CONTAIN HAZARDOUS OPERATIONS.

THE GROUND HYDRAULIC SERVICER, SUPPLY, AND RETURN FLEX HOSES ARE CHECKED FOR LEAKAGE AND FUNCTIONAL OPERATION OF COMPONENTS, CONNECTIONS AND LINES. HYDRAULIC FLUID IS CIRCULATED THROUGH ALL THE HYDRAULIC SERVICER UNIT SYSTEM VALVES AND FILTERS TO PURGE AND CLEAN THE SYSTEM. AT COMPLETION OF THE PURGE, FLUID SAMPLES ARE OBTAINED AND ANALYZED TO ENSURE THE FLUID IS ACCEPTABLE FOR USE IN FLIGHT HYDRAULIC SYSTEMS.

TEST REQUIREMENTS
MSFC: N/A

PHASE N/A

6 REV.	DATE	REASON	Contractor Approval	KSC Approval
B	6/7/74	TO REVISE DOCUMENTATION REQUIREMENTS	6/7/74	6/7/74
A	3/29/72	NON-HAZARDOUS PER KMI. 1710-13A/SF	3/29/72	3/29/72

7 CONTRACTOR APPROVAL
8. ORGANIZATION: CCSD
9. DATE: 9/22/71

10 NASA-KSC APPROVAL
11. ORGANIZATION: LV MEC 23
12. APPROVAL DATE: 10/28/71

KSC FORM 23-328 (7-67)

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1 TEST TITLE
MODEL VI GROUND HYDRAULIC SERVICER FUNCTIONAL CHECK-OUT AND PREPARATION TEST. (STANDBY)

2 MSC TEST NUMBER
V-34053

3 EFFECTIVITY
AS REQUIRED

13 LOCATION
VAB or PAD

14 COMPUTER PROC IDENTIFICATION
N/A

15 EST TEST TIME
5 HOURS

16 SUPPORT REQUIREMENTS

1) H. P. GAS
2) ELECTRICAL POWER (440 V, 60 CYCLE, 3 PHASE)
3) INDUSTRIAL WATER

17 OTHER APPLICABLE REFERENCE DOCUMENTATION
MSFC SPECIFICATIONS 166D, 20C85076

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1 TEST TITLE
IU PNEUMATIC CONSOLE SET UP

2 KSC TEST NUMBER
V-36038

3 EFFECTIVITY
AS-209 & SUBS

4 TEST OBJECTIVES

TO PRESSURIZE THE PNEUMATIC CONSOLE FOR MANUAL OPERATIONS, ST-124 GN_2 PURGE, HIGH PRESSURE REGULATOR SET UP (POWER ON), SETUP FOR REMOTE OPERATION, AND TO SECURE THE PNEUMATIC CONSOLE AFTER MANUAL OR REMOTE OPERATIONS.

5 TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST ☐ DOES ☒ DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

THE PNEUMATIC CONSOLE IS PRESSURIZED MANUALLY TO PROVIDE PNEUMATIC CONSOLE SUPPORT.

SECURING IS ACCOMPLISHED BY VENTING GN_2 FROM CONSOLE.

CONFIGURATION: INSTALLED ON LUT WITH HP GN_2 APPLIED.

PHASE: II, III, IV, V, VI

TEST REQUIREMENTS

MSFC: N/A

6 REV	DATE	REASON	Contractor Approval	KSC Approval
G	5/22/74	REVISED BLOCKS 3 & 17	D.F. Cole	P.Wilhelm
F	4/7/72	REVISED BLOCKS 3, 5, 13 AND 16	G.E. Lubin 4/10/72	P.Wilhelm
E	3-5-71	CHANGE PREFIX FROM "IV" TO "V" & BLOCK 15	G.E. Lubin 3/4/71	P.Wilhelm
D	2/17/69	CHANGE TO TEST OBJECTIVES, BLOCK 4	W.B. Kilgore	P.Wilhelm
C	07/3/68	CHANGE FROM HAZARDOUS TO NON-HAZARDOUS	S/J. H. HANSEN	S/P.W.SCHMID
B	05/7/68	MODIFY BLOCK 5	S/J. H. HANSEN	S/P.W.SCHMID
A	01/24/68	TO CHANGE BLOCKS 4 AND 5	S/J. H. HANSEN	S/P.W. SCHMID

7 CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
S/ J.H. HANSEN	IBM - M71	OCTOBER 4, 1967
10 NASA-KSC APPROVAL	11 ORGANIZATION	12 APPROVAL DATE
S/ PAUL SCHMID		OCTOBER 9, 1967

KSC FORM 23-338 7-67

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1 TEST TITLE
IU PNEUMATIC CONSOLE SET UP

2 KSC TEST NUMBER
V-36038

3 EFFECTIVITY
AS-209 & SUBS

12 LOCATION
LC 39

14 COMPUTER PROG. IDENTIFICATION
N/A

15 EST. TEST TIME
1 MAN - 1.5 HR TOTAL

16 SUPPORT REQUIREMENTS

INTERSTAGE: N/A
OFF COMPLEX: N/A
ON COMPLEX: IBM QA
RD 4290
RD 40092
RD 40093
IBM MECHANICAL

17 OTHER APPLICABLE REFERENCE DOCUMENTATION

MSFC-MAN-014

18 ITEM CONTINUATION

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE: IU UMBILICAL HOUSING INSTALLATION AND REMOVAL
2. KSC TEST NUMBER: V-36846
3. EFFECTIVITY: AS-206 & SUBS

4. TEST OBJECTIVES

PREPARE THE IU UMBILICAL HOUSING FOR INSTALLATION AND INSTALL ON THE VEHICLE.

REMOVAL OF HOUSING FROM UMBILICAL CARRIER.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST __ DOES XX DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

THIS OPERATION IS DIVIDED INTO TWO PARTS.

1. THE IU UMBILICAL HOUSING IS PREPARED FOR INSTALLATION AND INSTALLED ON THE VEHICLE.
2. THE IU UMBILICAL HOUSING IS PREPARED FOR REINSTALLATION OR REMOVED FROM THE UMBILICAL CARRIER SUPPORTS.

CONFIGURATION: VEHICLE STACKED.

PHASE: II, III

TEST REQUIREMENTS:
MSFC: N/A

6 REV.	DATE	REASON	Contractor Approval	KSC Approval
C	8/27/71	REVISED BLOCKS 3, 4, 5 AND 17	9/23/71	
B	4/7/72	REVISED BLOCKS 3, 4, 5, AND 16	4/6/72	
A	2-12-69	REVISED BLOCKS 1, 4, AND 5	2-11-69	4/1/69

7. CONTRACTOR APPROVAL: S/ W.B. HUNT
8. ORGANIZATION: IBM K73
9. DATE: 29 SEPTEMBER 1967
10. NASA APPROVAL: S/ PAUL SCHMID
11. ORGANIZATION: GD-25
12. APPROVAL DATE: 10-6-67

KSC FORM 21-1 (1-67)

REV 32

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE: IU UMBILICAL HOUSING INSTALLATION AND REMOVAL
2. KSC TEST NUMBER: V-36846
3. EFFECTIVITY: AS-206 & SUBS
13. LOCATION: VAB
14. COMPUTER PROG. IDENTIFICATION: N/A
15. EST. TEST TIME: 2 MEN - 8 HOURS

16. SUPPORT REQUIREMENTS

INTERSTAGE: S-IVB MECHANICAL, BOEING S/A

OFF-COMPLEX: N/A

ON-COMPLEX: IBM QA
IU VEHICLE NETWORKS
IBM MECHANICAL

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

ABMA-STD-18	75M 21452	MC-245
MSFC-MAN-010	75M 24737	

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

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1. TEST TITLE
UPPER PROTECTIVE RING, GUIDE PIN BRACKET, AND IU PROTECTIVE COVER INSTALLATION AND REMOVAL.

2. KSC TEST NUMBER
V-36048

3. EFFECTIVITY
SL-206 & SUBS AND AS-512 & SUBS

4. TEST OBJECTIVES

TO INSTALL AND REMOVE THE IU UPPER PROTECTION RING, GUIDE PIN BRACKETS, AND THE PROTECTIVE COVER.

5. TEST DESCRIPTION/EQUIPMENT STATUS CONFIGURATION

THIS TEST XX *DOES* ☐ *DOES NOT CONTAIN HAZARDOUS OPERATIONS.*

THIS PROCEDURE CONSISTS OF THREE PARTS.

PART I: UPPER PROTECTIVE RING INSTALLATION OR REMOVAL.

1. INSTALLATION:
THE TRANSPORTER AND UPPER PROTECTIVE RING ARE TRANSPORTED TO THE HOISTING AREA. THE HOISTING TOOL IS ATTACHED TO THE UPPER PROTECTIVE RING AND HOISTED TO THE IU. THE UPPER PROTECTIVE RING IS MATED TO THE IU.

2. REMOVAL:
THE TRANSPORTER IS MOVED TO THE HOISTING AREA. THE HOISTING TOOL IS ATTACHED TO THE UPPER PROTECTIVE RING. THE UPPER PROTECTIVE RING IS DEMATED FROM THE IU AND SECURED TO THE TRANSPORTER.

PART II: GUIDE PIN BRACKETS INSTALLATION OR REMOVAL.

PART III: IU PROTECTIVE COVER INSTALLATION OR REMOVAL.

1. INSTALLATION:
THE PROTECTIVE COVER IS LIFTED FROM THE 15TH FLOOR STORAGE PLATFORM, POSITIONED AND ATTACHED TO THE IU.

2. REMOVAL:
THE PROTECTIVE COVER IS REMOVED FROM THE IU AND PLACED ON THE 15TH FLOOR STORAGE PLATFORM.

CONFIGURATION: IU ERECTED ON S-IVB.

PHASE: II

TEST REQUIREMENTS
MSFC: N/A

SEE REV. LEVEL HISTORY IN BLOCK 18 CONTIN.

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
B	12-16-8	COMPLETE REVISION TO COMBINE TESTS		

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
S/ W.B. HUNT	IBM K73	28 SEPTEMBER 1967
10. NASA-KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
S/ PAUL W. SCHMID	JD-25	10-2-67

KSC FORM 23-338 (7-67)

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
UPPER PROTECTIVE RING, GUIDE PIN BRACKETS, AND IU PROTECTIVE COVER INSTALLATION AND REMOVAL.

2. KSC TEST NUMBER
V-36048

3. EFFECTIVITY
SL-206 & SUBS AND AS-206 & SUBS

13. LOCATION
LC 39

14. COMPUTER PROG. INDENTIFICATION
N/A

15. EST. TEST TIME
4 MEN - 16 HOURS

16. SUPPORT REQUIREMENTS

INTERSTAGE: S-IVB MECHANICAL

OFF-COMPLEX: SUPPORT CONTRACTOR SHOPS

ON-COMPLEX:
IBM QA
KSC SAFETY
SECURITY
SWING ARMS
PLATFORMS
750/75 TON CRANE
IBM MECHANICAL

17. OTHER APPLICABLE REFERENCE DOCUMENTATION
HT-322-13000 TM-SE700068
K-V-053
MGSE-D-604

18. ITEM CONTINUATION

BLOCK 6-REVISION HISTORY (CONTINUED FROM PAGE 1)

REV.	DATE	REASON	CONTR. APPRVL.	KSC APPRVL
C	4/7/72	REVISED BLKS 3, 5, AND 16		

266

505A
506

767

KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
TAIL SERVICE MAST SUPPORT OPERATIONS FOR LSE VAB AND PAD ELECTRO-MECHANICAL SYSTEMS TESTS

2. KSC TEST NUMBER
V-36111

3. EFFECTIVITY
CSE

4. TEST OBJECTIVES

To define operations required as preparations for and securing from LSE VAB AND PAD -- ELECTRO-MECHANICAL SYSTEMS TESTS.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGUNATION

THIS TEST [ ] DOES [x] DOES NOT ***CONTAIN HAZARDOUS OPERATIONS.***

Classification: Subtask

Prime Test Organization: Service Arm Systems

This test verifies the firing circuits to HRV #1 and HRV #2 are satisfactory to support launch. Normal operating pressure will be used to operate these valves.

[redacted]

6. REV.	DATE	REASON	Contractor Approval	KSC Approval

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
W. E. Estes/W. F. Dreyer	BATC 5-8521/5-8552	8/27/68
10. KSC APPROVAL	11. ORGANIZATION	12. APPROVAL DATE
G. H. Robinson	LV-MEC-12	

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
TAIL SERVICE MAST SUPPORT OPERATIONS FOR LSE VAB AND PAD ELECTRO-MECHANICAL SYSTEMS TESTS

2. KSC TEST NUMBER
V-36111

3. EFFECTIVITY
CSE

12. LOCATION
VAB & PAD

14. COMPUTER PROG. IDENTIFICATION
N/A

15. EST. TEST TIME
8 HRS.

16. REPORT REQUIREMENTS

Ref: RD 40009

17. OTHER APPLICABLE REFERENCE DOCUMENTATION

V-20052
V-20055

18. ITEM CONTINUATION

KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
TCE STAGE MODULE PRETEST PREPARATIONS

2. KSC TEST NUMBER
V-38010

3. EFFECTIVITY
206 & Subs LC-39

4. TEST OBJECTIVES

TO VERIFY THE OPERATIONAL STATUS OF THE TCE STAGE MODULE AND ESTABLISH A BASELINE CONFIGURATION OF PATCHING AND ADJUSTMENT IN PREPARATION FOR TEST SUPPORT.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST DOES XX DOES NOT *CONTAIN HAZARDOUS OPERATIONS.*

The RF signal generator is functionally checked and the deviation meter accuracy is verified at two points by the carrier null method. The FM test oscillator is checked for carrier deviation levels using the deviation meter. Discriminator input levels are measured by a DVM and are recorded for references utilizing the Test Oscillator and RF signal generator as inputs to the GF Receiver. During VAB OPS the 450 KHZ Demod output is set to establish discriminator input level reference. The receivers are checked for correct control settings and functional operation. The Oscilloscope and frequency counter are verified functionally.

The 600 KHZ Demod is functionally tested using the PCM simulator as a 600 KHZ source. Correct display of a digital word through the S-IB Decom is verified utilizing the 16 channel D/A converter. The two 8-channel brush recorders are functionally verified by utilizing station calibration levels.

Patching is configured for test support.

Vehicle configuration is not applicable.

Test Requirements
MSFC - N/A
KSC - N/A

6. REV.	DATE	REASON	Contractor Approval	KSC Approval
A	8-26-74	To conform with TCE Relocation to CIF		

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
J.R. Howard	CCSD	12-7-71
10. NASA-KSC APPROVAL	**11. ORGANIZATION**	**12. APPROVAL DATE**
L.C. Blanchard	LV-INS-12	12-10-71

KSC FORM 23-338 (7/67)

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF 2

1. TEST TITLE
TCE STAGE MODULE PRETEST PREPARATIONS

2. KSC TEST NUMBER
V-38010

3. EFFECTIVITY
206 & Subs LC-39

13. LOCATION
CIF/TCE (291 & 2P12)

14. COMPUTER PROG. IDENTIFICATION
N/A

15. EST. TEST TIME
4 hours

16. SUPPORT REQUIREMENTS

CIF/TCE (291 & 2P12)

17. OTHER APPLICABLE REFERENCE DOCUMENTATION
Operations and maintenance telemetry checkout equipment
Vendors Manuals for Installed Test Equipment
CIF/TCE (291 - 2P12) System Drawings

18. ITEM CONTINUATION

REV 32

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KSC OPERATIONS
APOLLO SATURN TEST AND OPERATIONS CATALOG SHEET

PAGE 1 OF 2

1. TEST TITLE
RF AND TELEMETRY PLUGS OUT OAT PREPARATIONS AND SECURING

2. KSC TEST NUMBER
V-38011

3. EFFECTIVITY
206 & Subs LC-39

4. TEST OBJECTIVES
TO PROVIDE A PATH FOR UNINTERRUPTED SIGNAL FLOW TO AND FROM THE RF AND TELEMETRY EQUIPMENT DURING PLUGS OUT OAT. THIS IS PROVIDED BY INSTALLATION AND SUBSEQUENT REMOVAL OF THE RF AND TELEMETRY OAT CABLE.

5. TEST DESCRIPTION EQUIPMENT STATUS CONFIGURATION

THIS TEST DOES X DOES NOT CONTAIN HAZARDOUS OPERATIONS.

The RF and Telemetry OAT Cable is installed between the VAB Level C bulkhead connector and RF/TM systems located in Unit 13 of the SIB Stage. Connections are made to the DRSC power divider, DRSC Decoders 1 and 2, Telemetry PCM/DDAS Assembly and the Telemetry RF Coupler. This provides RF command input to the DRSC system, Audio outputs from both decoders, 600 KHZ DDAS output for the PCM/DDAS and RF output from the telemetry systems. After SIB Stage power application, reception of the 600 KHZ DDAS signal is verified at the TCE.

After completion of the swing arm test, the RF/TM OAT cable is removed and the Airborne systems configuration is restored.

The vehicle must be in VAB High Bay 1.

TEST REQUIREMENTS
MSFC - N/A
KSC - N/A

6. REV.	DATE	REASON	Contractor Approval	KSC Approval

7. CONTRACTOR APPROVAL	8. ORGANIZATION	9. DATE
10. NASA KSC APPROVAL	11. ORGANIZATION LV-INS-11 LV-INS-12	12. APPROVAL DATE 12/10/71

APOLLO SATURN TEST AND OPERATIONS CATALOG (SHEET 2)

PAGE 2 OF

1. TEST TITLE
RF AND TELEMETRY PLUGS OUT OAT PREPARATIONS AND SECURING

2. KSC TEST NUMBER
V-38011

3. EFFECTIVITY
206 & Subs LC-39

13. LOCATION
LC-39

14. COMPUTER PROC. INDENTIFICATION
N/A

15. EST. TEST TIME
2 Hours

16. RESULT REQUIREMENTS

1. Access to Unit 13
2. Access to M. L. Distributor 9020

17. OTHER APPLICABLE REFERENCE DOCUMENTATION
Skylab II, III, IV RF & TM Cables, Drawings No. LV-INS-12-2
TM System Functional Drawing 77K09178

18. ITEM DISTRIBUTION

KSC FORM 23-81C (6/64)

DATE: OCTOBER 4, 1974
REVISION 32

LAUNCH OPERATIONS

PAGE DISTRIBUTION
TEST NO. GP-592
VEHICLE SAT V/IB

KENNEDY SPACE CENTER

BUCHANAN, D.D.	DD	1
PARSONS, W.	DD-SED	1
COONCE, J.M.	IN-OMO	5
FIKE, J.W.	IN-QAL	1
LIBRARY	IS-DOC-1L	2
ARBIC, R.G.	LA-PLN-2	1
KECK,J.E.	LO-RRO-1	1
MEDLOCK, J.R.	LV-CAP	1
LEALMAN, R.E.	LV-GDC	1
CHAMBERS, M	LV-GDC-1	1
CHANDLER, W.O.	LV-GDC-2	1
WHITESIDE, C.A.	LV-GDC-3	1
HUFFMAN, B.	LV-INS-1	1
FITZGERALD, J.J.	LV-INS-2	1
O*HARA, A.	LV-OMO	1
MARIANI, T.	LV-OMO-1	6
HORNE, C.V.	LV-QAL	1
BISHOP, E.	TS-NTS-1	1
THARPE, R.C.	TS-OSM	1

GELZER, J.R.	CHRY-16/VAB 15B10	15	
HAYES, W.W.	IBM-922/VAB 2N11	12	
NICHOLS, H.	MDAC/VAB 3L4	5	
ANDERSON, B.C.	ROC-2/VAB 3N9	2	
BOYETTE, M.	BOFM-49/VAB 3N1	15	
WEINBERG, D.B.	BOFM-35/VAB 2L3	5	PLUS ORIGINALS & EXTRAS

MARSHALL SPACE FLIGHT CENTER

SAT-A	KEYES	1
SAT-C	RAINS	1
SAT-E	BARNES	1
SAT-SE	FERRELL	1
SAT-IU/GSE	GALEY	1
SAT-SII/IVB	LAHATTE	1
S&E AERO-P	TEAGUE	1
S&E ASTN-SO	SELLS	6
S&E ASTR-SS	JOHNSON	1
S&E ASTR-ST	GLASS	3
S&E QUAL-PC	COVINGTON	3
S&E S/P-EH	VEDANE	1

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NASA/PAFB JUN/72